VOLUME 39
NUMBER 6

JUNE, 1952

plating

AMERICAN ELECTROPLATERS' SOCIETY

39th. ANNUAL CONVENTION
AND 3rd. INDUSTRIAL
FINISHING EXPOSITION

JUNE 16—19, 1952
CHICAGO, ILLINOIS

CONVENTION HEADQUARTERS
CONRAD HILTON HOTEL

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EXTRA FINE CUT FOR MICRO FINISH

CLEPO Deburring Compounds are designed for use with all types of tumbling mediums and for use on all base metals.

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WITHOUT ACIDS!
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ALKALINE DERUSTING COMPOUND 134
Do You Know What This Means?
1 Absolutely no tarnishing, etching or darkening of steel during derusting.
2 Clean and derust in one operation.
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4 No acid or corrosive fumes around.
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7 Derust coppered, galvanized and tinned surfaces without stripping the copper, zinc or tin, e. g. milk cans.
8 Pickle fast at room temperature.
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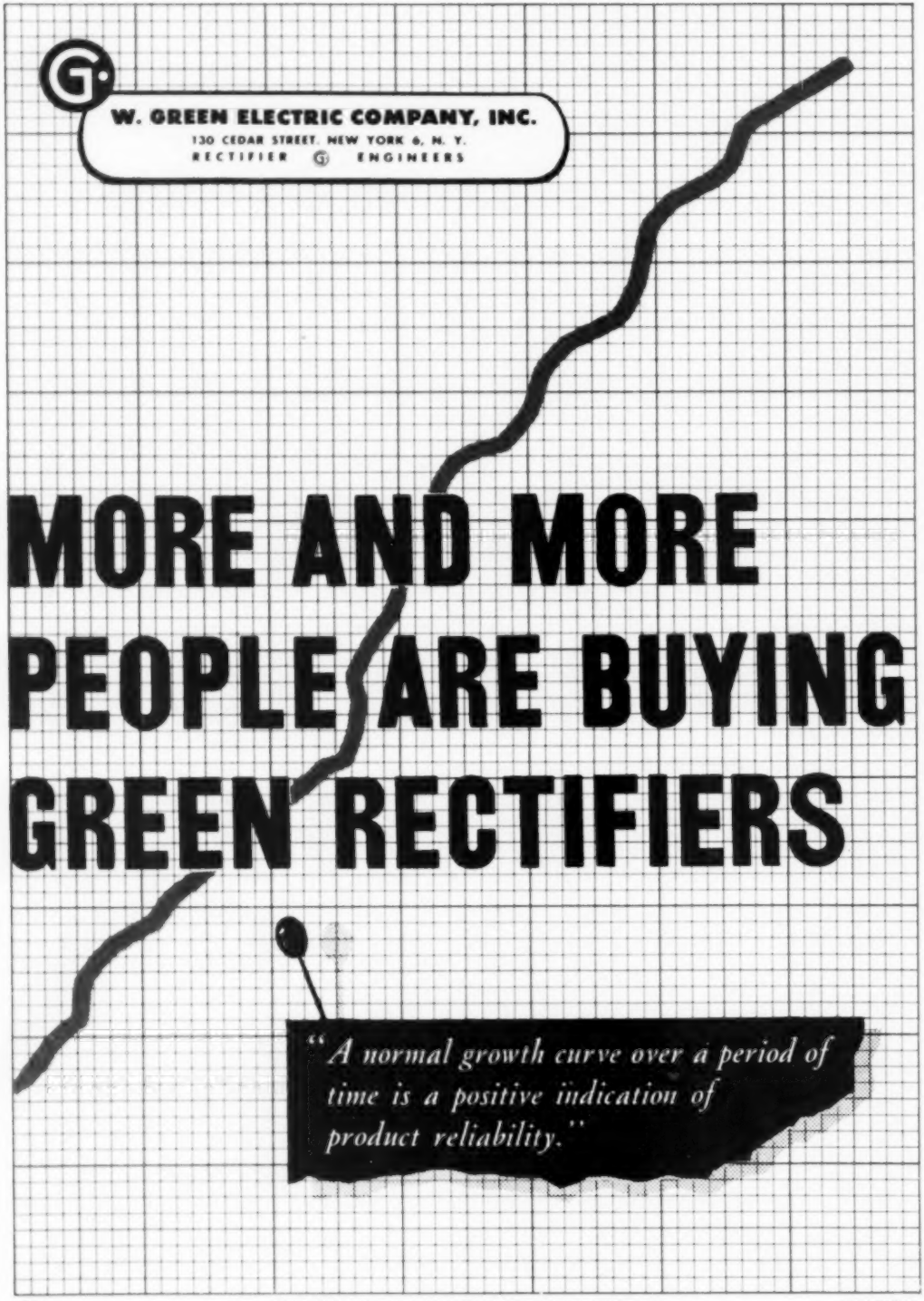
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PEOPLE ARE BUYING
GREEN RECTIFIERS
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LET US SUPPLY YOUR NEEDS FOR YOUR PLATING OR POLISHING DEPARTMENT

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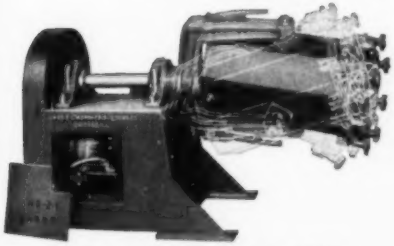
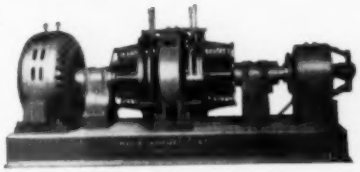
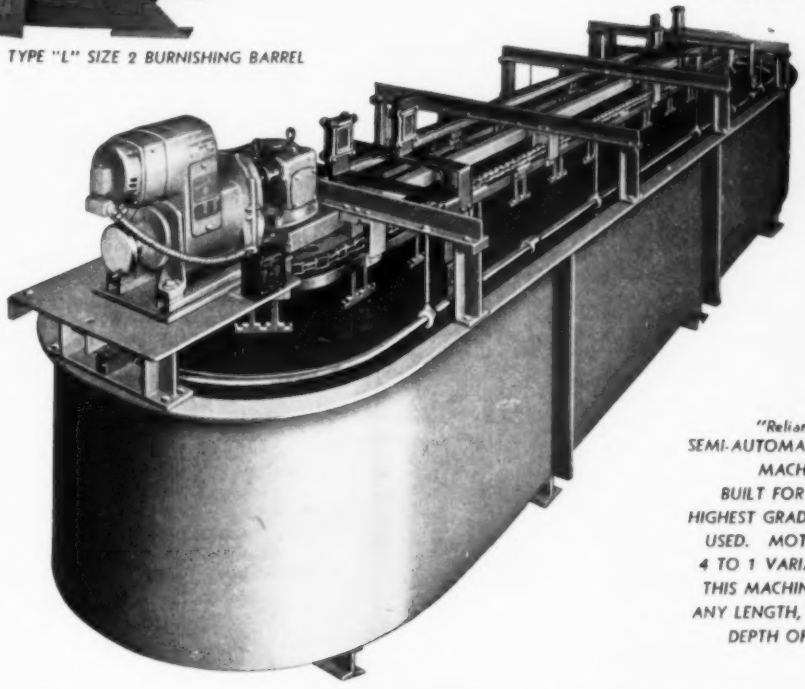


TYPE "L" SIZE 2 BURNISHING BARREL



3000 AMP. 6 VOLT GENERATOR SET



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SEMI-AUTOMATIC PLATING MACHINE
BUILT FOR SERVICE
HIGHEST GRADE MATERIAL USED. MOTOR ½ HP
4 TO 1 VARIABLE SPEED.
THIS MACHINE IS BUILT ANY LENGTH, WIDTH AND DEPTH OF TANK.

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WITH

SPARKLER FILTERS

A matter of minutes not hours for a complete change of plates in a Sparkler filter.

No shut down of production to dismantle and clean each plate separately, then reassemble the complete filter, with hours of lost operating time and a messy clean up job.

The complete plate cartridge assembly is hoisted out of the Sparkler filter tank and a clean set of plates lowered in position and the filter is working again in a few minutes. Can you do this with your present filter?

One Sparkler filter with an extra set of plates is equal to two filters for continuous operation in most chemical production line installations.

Write Mr. Eric Anderson for personal engineering service on your particular filtering problem.

Makers of filters for the Chemical, Pharmaceutical, Food and Petroleum Industries for over a quarter of a century.

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Industry News

Perchlorethylene Facilities. Diamond Alkali Company has announced a change in its expansion plans which will increase chlorine-producing capacity by 10 per cent at its Houston, Texas plant. This additional capacity, needed for the manufacture of perchlorethylene, originally was part of the expansion program at the company's plant at Painesville, Ohio. Diamond now plans to construct the perchlorethylene unit at Houston because of more favorable market conditions.

The Cro-Plate Company, Hartford, Conn., because of increasing demand for its equipment has expanded the manufac-

turing division to include the entire area of the company's Windsor St. plant. The contract plating division of the organization, which formerly shared factory space with the manufacturing division, has been reduced and transferred to the Cro-Plate Company's East Hartford plant.

The Hampel-Modjeska Laboratories were recently formed by Clifford A. Hampel, formerly supervisor of extraction metallurgy at Armour Research Foundation, and R. Scott Modjeska, founder and director of Scientific Control Laboratories of Chicago, Ill. The new organization will conduct research and development, technological and economic evaluations and consulting work for industry and government in the fields of industrial chemicals, electrochemical and electrometal-

WANTED

Research Associate of American Electroplaters' Society to work at National Bureau of Standards on permeability and protective value of electroplated coatings. College graduate. Salary $3400-4200 per year. Application should include qualifications and minimum acceptable salary.

Reply to:

Fielding Ogburn
National Bureau of Standards
Washington 25, D. C.

Published monthly at 5800 N. Marvine St., Philadelphia 41, Pa. Entered as second class matter July 1, 1946, at the Post Office at Philadelphia, Pa., under Act of August 24, 1916. Subscriptions: Domestic and Canada, $4.00 for 1 year, $7.00 for 2 years 50c per copy; Foreign, $8.00 per year, $1.00 per copy.

TUMBLE

GRAV-I-FLO FINISH scores again!

with new two deck parts-and-chips separator and chip grader

A new companion to the Grav-i-Flo complete line of tumbling equipment, accessories and supplies.

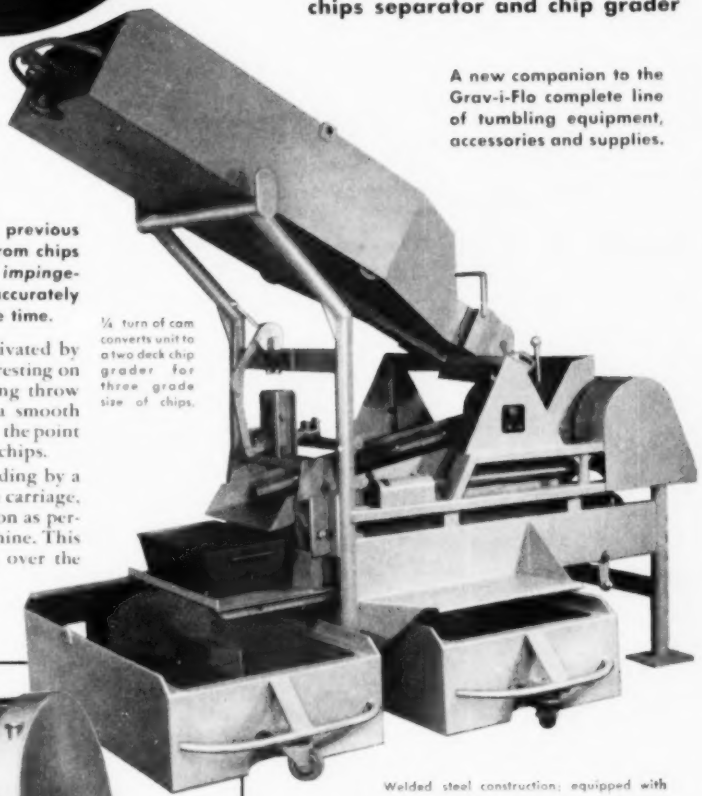
Better in 3 ways!

1. Occupies ½ floor space of previous separators. 2. Separates parts from chips quickly, accurately and *without impingements*. 3. Double deck screens accurately grade three sizes of chips at one time.

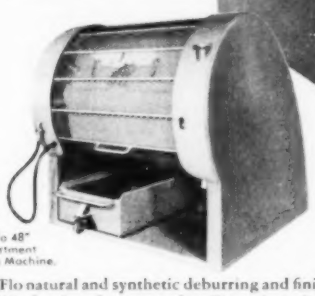
Inclined end of carriage motivated by an eccentric, with the lower end resting on ball bearing rollers. The resulting throw of the screen is blended into a smooth backward and forward motion at the point of separation of parts from the chips.

Machine converts to chip grading by a cam raising the lower end of the carriage, to create the same eccentric action as performed at the back of the machine. This results in a uniform separation over the entire length of the two deck screen carriage.

¼ turn of cam converts unit to a two deck chip grader for three grade size of chips.



Welded steel construction; equipped with ½ h. p. variable speed drive; switch; overall floor space 3' x 6'; with pans 3' x 8'.



Grav-i-Flo 48" 2 Compartment Tumbling Machine.

Grav-i-Flo natural and synthetic deburring and finishing chips, and highly developed compounds will consistently outperform every type of finishing material being offered on the market.

This statement has been proved to many hundreds of users in all types of industry. Let us prove it to you at no obligation by processing your samples.

Write for catalog showing complete line of Grav-i-Flo finishing and deburring materials and equipment.

THE GRAV-I-FLO CORPORATION

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STURGIS, MICHIGAN

Industry News

surgical processes and products, and the recovery and utilization of strategic metals.

Until new quarters are available, the Hampel-Medjeska Laboratories will use the facilities of the **Scientific Control Laboratories**, 600 S. Blue Island Ave., Chicago, Ill.

Wagner Brothers Expand Anode Production Facilities. J. B. Wagner, President, Wagner Brothers, Inc., Detroit, Mich., has announced the completion of the new wing which will house additional anode production facilities. The occasion was celebrated by a dinner and entertainment for approximately 1,500 guests in the new building before equipment was moved in. The new construction is the fourth expansion in as many years, and will more than triple existing production of Flat-Top and Iso-Cast anodes.

E. I. duPont de Nemours & Company's 150th Anniversary will be celebrated on July 18 at the site of the first DuPont powder mills on the banks of Brandywine Creek a few miles from Wilmington, Del. The ceremonies will include a simple historical dramatic prologue, addresses by company officials, and the dedication of a marker on the site of the first plant.

The marker will be formed by one of two huge millstones ordered from France by the founder of the company in 1801. The stone weighs about seven tons, and its function, by the application of water power, was to grind the ingredients of black powder—sulfur, charcoal and saltpeter.

The story of Du Pont's growth will be told in a book, "Du Pont—The Autobiography of an American Enterprise", to be published about the first of July. Largely pictorial, with many illustrations in color, the book will relate the company's activities and operations to broad economic and social developments in the United States. Du Pont now employes 87,000 men and women, is owned by 138,000 stockholders, sells thousands of chemical products to more than 75,000 customers, and buys from more than 30,000 suppliers.

Methods Improvement. Student groups in colleges and universities studying industrial engineering, as well as industrial plants and companies, are invited to submit entries in the 1952 Methods Improvement Competition sponsored by

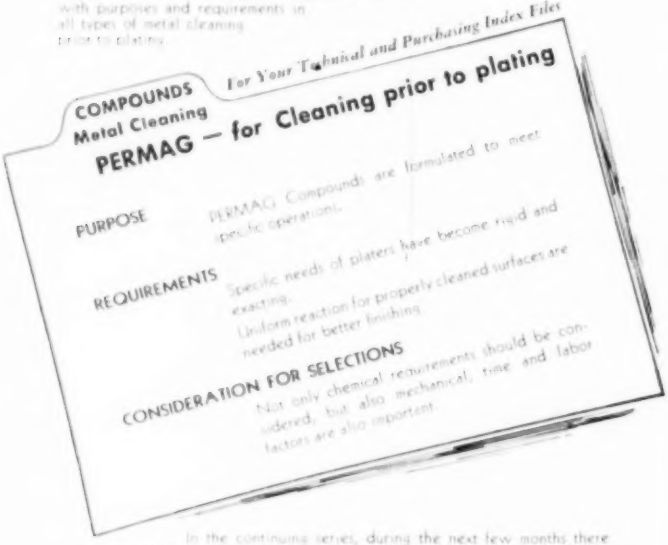
PERMAG

CLEANING COMPOUNDS

***Standard* in the Electroplating Industry**

The PERMAG Series running in PLATING for several months have covered a wide range of accurate information on metal cleaning.

Doubtless you've followed these Index File Cards from month to month, and have observed how PERMAG fits in with purposes and requirements in all types of metal cleaning prior to plating.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COMPOUNDS
Metal Cleaning
PERMAG — for Cleaning prior to plating
PURPOSE
PERMAG Compounds are formulated to meet specific operations.
REQUIREMENTS
Specific needs of platers have become rigid and exacting.
Uniform reaction for properly cleaned surfaces are needed for better finishing.
CONSIDERATION FOR SELECTIONS
Not only chemical requirements should be considered, but also mechanical, time and labor factors are also important.

In the continuing series, during the next few months there will be shown more new developments in cleaning the PERMAG way and the resultant satisfaction.

MAGNUSON PRODUCTS CORPORATION

Mfrs. Specialized Cleaning Compounds for Industrial Purposes

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BUFF SALESMEN

A buff manufacturer, established over fifty years, desires sales representatives for Metropolitan Chicago, Rockford, Peoria, Ill.; also, Indianapolis and Dayton territories. Areas not presently covered. A most complete quality line including air-cooled bias buffs. Attractive commission basis. Will aid in obtainment of other lines to carry. Interviews can be arranged at June A.E.S. Convention, Chicago, or earlier. Give resume of background and experience in reply.

Reply to:

P-652-A, PLATING

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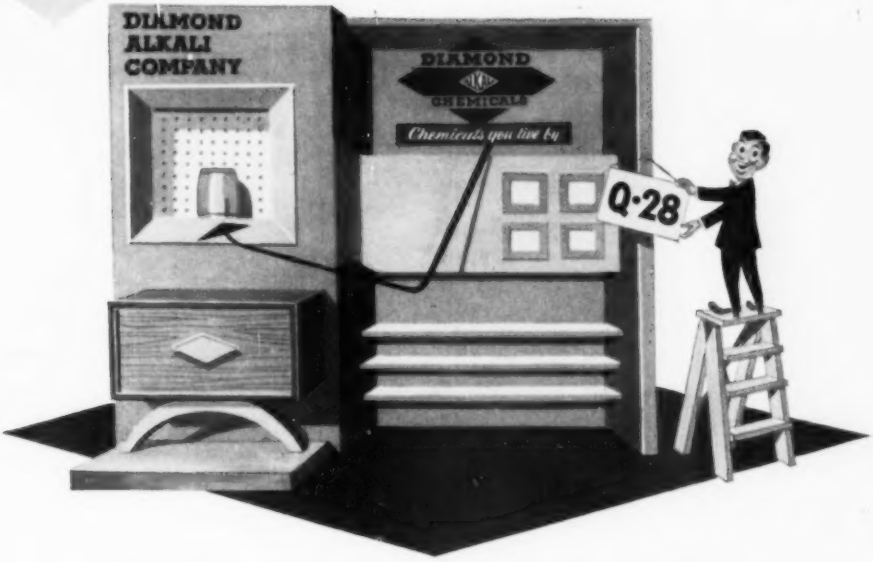
Chemicals you live by



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. . . for Chromic Acid • Caustic Soda • Bichromate of Soda

Come in and talk over your finishing problems with DIAMOND in Booth Q-28 at the Industrial Finishing Show! Let us show you how we can help you solve these three types of plating room problems:

TECHNICAL PROBLEMS—You'll find experts from DIAMOND's Technical Center ready to talk over plating room procedures and practices.

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Come see us at Booth Q-28, International Amphitheater, June 16th to 19th. We'll look forward to meeting you.

DIAMOND SALES OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis and Houston. Representatives in other principal cities.

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PRECIOUS METAL SALTS & SOLUTIONS

As specialists in the precious metals, we have both the facilities and the trained personnel best able to produce salts and solutions for the plater. As a result, ours enjoy a well earned reputation for high quality and consistent performance.

RHODIUM PLATING SOLUTION
It was in our plant that the answer to the problem of rhodium plating on a commercial scale was found. Our solution is made under the direct supervision of the men responsible for this development.

PLATINUM PLATING SOLUTION
We have developed platinum plating to a point where it stands upon a truly scientific basis. Both flash and heavy deposits are made from the same solution.

PALLADIUM PLATING SOLUTION
Produces a flash plate in from 15 to 60 seconds. Heavy deposits can be made from the same solution. Gives excellent results in plating connectors, wave-guides and other electronic equipment.

CONCENTRATED GOLD PLATING SOLUTION No. 319
Containing one ounce of fine gold.

CONCENTRATED REPLENISHING SOLUTION No. 320
Containing one ounce of fine gold.

CONCENTRATED UNDERPLATE OR STRIKE No. 3215
Containing one-half ounce of fine gold.

GOLD COLORING SOLUTIONS
For light, yellow, red and green gold.

HIGH GOLD CYANIDES
Our sodium-gold cyanide contains 71.5 per cent of fine gold and our potassium-gold cyanide 67 per cent as compared with commercial salts of 46 and 41 per cent. Gold content for gold content, our high gold cyanides cost you no more. We make the commercial 46 and 41 per cent salts too.

SILVER SALTS—SILVER ANODES
We make silver cyanide and silver nitrate as well as silver anodes.

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THE *Ultimate* CHOICE FOR *Efficient* POLISHING

• For the finest metal finishing jobs use sharp, durable grains of EXOLON RST (aluminum oxide). Careful grading, shaping and magnetic separation assure an abrasive product that gives you highest efficiency in the polishing of all types of tough metals, including spring steel, sheet metal, cold rolled stock, forgings and stainless steel.

Ceramically coated for strongest adhesion to the set-up wheel. The tough abrasive features of EXOLON RST are basic requirements for fine metal finishing.

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THE EXOLON COMPANY

973 East Niagara Street — Tonawanda, New York

Manufacturers of SILICON CARBIDE *and* ALUMINUM OXIDE ABRASIVES

Industry News

the Industrial Management Society. Special Achievement Awards will be presented at the Society's 16th Annual Clinic scheduled for November 5-7 at the Sheraton Hotel, Chicago. Rules and regulations for the Competition may be had by writing the Industrial Management Society, 35 E. Wacker Drive, Chicago 1, Ill.

Motor Slidefilm. A 35-mm black-and-white sound slidefilm and allied literature on "Selection and Application of Fractional Horsepower Motors" has been announced by the General Electric Company. It is an addition to the company's Motor Selection Course, a training program launched last year as No. 22 in the G-E "More Power to America" series.

The new film, running time 21 minutes, describes the broad uses of fhp motors in the home, on the farm, in factories and offices. It explains the five different kinds of motors in the fhp family: a-c single-phase types (capacitor, split-phase, and shaded-pole), and a-c polyphase and d-c types.

The Motor Selection Course consists of nine slidefilm "lessons" (each with a 16-in. sound recording), 10 copies each of nine student review booklets on the lessons, and an instructor's manual, all packaged in a luggage-type carrying case. The complete course is available for single showings from G-E apparatus offices, or it can be purchased outright from the company.

Nickel Process Development Plant. The H. K. Ferguson Company, industrial engineers and builders with offices in New York and Cleveland, has been awarded a contract to engineer a process-development plant for the Nickel Processing Company. The pilot plant will be built at the U. S. Government-owned Nicaro Nickel Plant in Nicaro, Cuba, which is operated by Nickel Processing Company under a management contract. The project is part of that company's program for production of additional tonnages of nickel, and the recovery of by-product cobalt.

Masters' Electro-Plating Association, New York, at its March meeting elected the following to its Executive Committee:

Irving Berkman—Berkman Bros.
Joseph Brust—Brust Bros., Inc.
Jesse Goldman—Grand Chromium Plating Corporation
Philip Ranno—Imperial Plating Company
L. A. Kornblum—Kings Electro-Plating Company
Frank Kaiser—L. I. Mechanical Plating Company
Sidney Rosenthal—National Chromium Corporation
Julian Nelkin—Henry Nelkin, Inc.
Sal Novelli—Service Plating Company
Philip Sievering—Philip Sievering, Inc.
John Forbath—Star Chromium Corporation

The Secretary of the Association, S. C. Lucmma, reported on National Association activities and progress of Workmen's Compensation, and was barraged by many questions during the Technical session.

A. S. T. M. 50th Anniversary Meeting in Hotel Statler, New York City, on June 23-27 offers a varied program. Among the symposia are those on "Tin",

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as well as a trial in your own plant!

Write today for a specially priced trial order of the ARP Brighteners for any zinc or cadmium plating solution. Or see your Indite Representative.

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Manufacturers of Indite Finishes
for Corrosion Resistance and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals.

PLATING SUPERINTENDENTS AND FOREMAN!

Old established manufacturer of metal cleaning chemicals, needs several qualified technical sales representatives for the East and Mid West. We want men with personality and sales aptitude between the ages of 30-40 years. Good training period. Car furnished, liberal drawing account and expenses. There is no limit on commission earnings.

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WANTED

A good all-round electro-plater to work in a job shop in Honolulu on a permanent basis. Prefer a family man between 30 and 40 years of age. Must be capable of taking complete charge. Good position and salary to right man. Write, giving complete details, references and proposition expected, to:

Automotive Service Co., Ltd.
P. O. Box 2395, Honolulu, T. H.

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Volume of Technical and Scientific Papers and Discussions Presented During the 1951 A. E. S. Convention

Electrodeposition Researches at the National Bureau of Standards; Rinsing for Electroplating; Practical Application of Diaphragm Tanks in the Electroplating Industry; Heating and Temperature Control of Plating Solutions; Advantages of Simplicity in the Electroplating of Automobile Bumpers; Requirements, Mechanical Finishing, Chemical and Electrochemical Preparation of Zinc Base Diecastings for Plating; Electroplating Zinc Base Diecastings; Evaluation of Electrodeposited Coatings; Operating Control for Optimum Plating Characteristics; Some Practical Considerations of Current Distribution; A New Degreasing Evaluation Test: The Atomizer Test; How the Plating Industry Will Benefit from Research on Metal Cleaning; Highlights of the A. E. S. Research Program.

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CONVENTION HIGHLIGHTS

JUNE 16-19, CHICAGO, ILLINOIS

Keynote speech: THE NEED FOR STABILIZATION IN THE DEFENSE ECONOMY by MICHAEL DiSALLE of Toledo, Ohio. This address by a national figure who is also familiar with electroplating and metal finishing will be of extreme general interest.

The first CARL E. HEUSSNER AWARD will be presented by another well-known personage.

THE EDUCATIONAL SESSIONS made up of eighteen papers including A SYMPOSIUM OF ENGINEERING MATERIALS must not be missed.

A QUEEN will be crowned and an excellent LADIES' PROGRAM is planned.

The usual ENTERTAINMENT AND FUN AND MORE plus the INDUSTRIAL FINISHING EXHIBITION.

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: IMPROVING PAINT ADHESION ON STEEL WITH GRANODINE®

INTRODUCTION

"Granodine" is a zinc phosphate coating chemical which improves paint adhesion on steel, iron and zinc surfaces. In the Granodizing process, a non-metallic crystalline coating is formed on the treated metal. This bond holds and protects the paint finish and thus preserves the metal underneath.

Official Dept. of Defense Photograph

An F4U Corsair with the Navy's new air craft anti-tank rocket, the "RAM". A Grade I zinc phosphate finish (JAN-C-490) protects the entire external surface of this rocket and provides a durable bond for the specification paint finish.

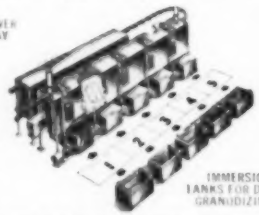
"GRANODINE" MEETS SERVICE SPECIFICATIONS

JAN-C-490, Grade I	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS
JAN-F-495	FINISHES FOR EQUIPMENT HARDWARE
U.S.A. 57-0-2C Type II, Class C	FINISHES, PROTECTIVE, FOR IRON AND STEEL PARTS
U.S.A. 51-70-1, Finish 22.02, Class C	PAINTING AND FINISHING OF FIRE CONTROL INSTRUMENTS; GENERAL SPECIFICATION FOR
MIL-V-3329	VEHICLES, COMBAT, SELF-PROPELLED AND TOWED; GENERAL REQUIREMENTS FOR

GRANODIZING DATA

Granodizing is an easily applied chemical process. Depending on the size, nature and volume of production, Granodizing can be carried out by spraying the parts in successive stages of a power washing machine, by dipping the work in the cleaning, rinsing and coating baths contained in tanks, or by brushing or flow coating the work with portable hand equipment. Typical process sequence and equipment requirements are shown below.

MULTI-STAGE POWER WASHER FOR SPRAY GRANODIZING



PROCESS SEQUENCE

1. Clean
2. Rinse
3. "Granodine"
4. Rinse
5. Final Rinse

IMMERSION TANKS FOR DIP GRANODIZING

NOTE: Equipment can be of mild steel throughout, except in the Granodizing stage where nozzles, risers, and pump impeller should be of acid-resistant material.

MANY APPLICATIONS

Automobile bodies and sheet metal parts, refrigerators, washing machines, cabinets, etc.; projectiles, rockets, bombs, tanks, trucks, jeeps, containers for small arms, cartridge tanks, 5-gallon gasoline containers, vehicular sheet metal, steel drums and, in general, products constructed of cold-rolled steel in large and continuous production are typical of the many products whose paint finish is protected by "Granodine".

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "GRANODINE" AND YOUR OWN METAL PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

Industry News

"Continuous Analysis of Industrial Water and Industrial Waste Water", "Conditioning and Weathering", and "Paint".

Many new and interesting pieces of scientific and testing equipment will feature the *Exhibit of Testing Apparatus and Laboratory Supplies*. Fifty-five leading manufacturers and distributors of instruments and laboratory supplies will show equipment for the determination of mechanical, physical, electrical, optical and chemical properties of materials of all kinds. Various types of non-destructive testing will be featured.

Adjoining the apparatus exhibit will be the 8th Photographic Exhibit in which members of A. S. T. M. and member companies will display photographs related to the theme: Materials, Testing and Research.

Who Will Be Queen of the Convention

Discover for Yourself In Chicago—June 16!

The Scientific Instrument and Laboratory Apparatus Industry recently issued a plea to its customers to apply priority ratings to all orders.

From all sections of the country come reports that shelves of instrument and apparatus distributors are getting bare spots and that manufacturers' stocks of raw materials are practically cleaned out.

WANTED

Supervisor for Plating and Polishing Departments. Must have thorough knowledge of zinc, nickel, and chrome solutions, be able to do all his own chemical analyzation. Must also have thorough knowledge of polishing and various grit finishes. Must be able to supervise workers competently.

Reply to:

P-652-C, PLATING

445 Broad St., Newark 2, N. J.

A COMBINATION THAT IS HARD TO BEAT

Cowles

K W and S K

All subsequent cleaning operations are reduced to a minimum by using K W alkaline cleaner and S K emulsion type cleaner together in the pre-soak operation. These two fast acting, efficient and economical cleaners do a real job of removing oils and stubborn soil when used in combination.

K W Cleaner alone will handle all cleaning operations after the soak cleaning. It can be used in still tanks—with or without electric current.

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PROMPT SHIPMENTS FROM LOCAL STOCKS

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METAL CLEANER DEPARTMENT • CLEVELAND 3, OHIO

Here's your guarantee of *Top Quality* SILVER PLATING at low cost

HANDY & HARMAN 999 "PLUS" FINE SILVER ANODES

When you see that triangle and "999 + FINE" mark on a silver anode you can be sure of three things about that anode—(1) it is free of every trace of impurities that can cause plating troubles—(2) it measures up to highest standards in fineness—(3) it has physical properties that are ideal for plating. . . . And when you use those anodes you can be sure of smooth going, profitable production of top quality plating. Next time you buy silver anodes, try the "999 + FINE" brand and see the difference.

HANDY & HARMAN

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The GILBERT TRAMER Co.

POLISHING AND PLATING EQUIPMENT

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Industry News

The industry was recognized as "essential" by the National Production Authority in Order M-71. All laboratories have permission to use Priority Do-X1 to purchase their instruments and supplies.

The American Agile Corporation, fabricators of Agilene (Polyethylene) and Agilide (Hard Polyvinyl Chloride) products, announces the completion of a new 12,500 sq ft building.

Located at 5461 Dunham Rd., Maple Heights, Ohio, with mailing address P. O. Box 168, Bedford, Ohio, the expanded production facilities permit the manufacture of a complete range of standard and custom-built corrosion resistant bottles, containers, tanks and tank liners, pipe lines, equipment, and apparatus.

Titeflex, Inc., manufacturers of filters, announces the appointment of **William Buckley** as West Coast Sales Representative with offices at the Salsbury Corporation, 1161 E. Florence Ave., Los Angeles, Calif.

Electrochemical Industries, Inc., Jacques St., Worcester, Mass., has been designated a manufacturers agent by the **Berzworth Chemical Company,** Framingham, Mass., to handle the sales and distribution in the metal finishing and allied fields of the wide variety of complexing and chelating agents known as Versenes and manufactured by the latter company. These newly developed organic compounds are finding numerous applications in water softening, removal of impurities from such plating solutions as nickel, copper, zinc, silver and gold baths, and for inactivations of troublesome metallic impurities in other process solutions. Their use in cleaner formulations, detergents and in connection with wetting agents and polyphosphates is also reaching significant proportions. Electrochemical Industries, Inc., offers technical assistance in the proper application of these compounds.

Absenteeism costs employers on the average $56.00 per employee per year for every employee on the payroll, according to the findings of a survey on the cost of absenteeism which was conducted by **Benson Laboratories, Inc.,** Pittsburgh, Pa.

This survey, probably the first of its kind ever made, covered 249 representative companies in all sections of the country. It revealed three significant facts: (1) Less than 25 per cent of the companies maintained records of employee absences, this in spite of knowledge that absenteeism disrupts operations, slows down production in both plant and office, and is therefore an expense factor of sizable proportions. (2) Only 8 per cent of the companies maintained records complete enough to permit their use in determining the cost of absenteeism. (3) The average direct cost among companies keeping accurate records was $56.02 per employee per year. To American industry with its 60 million workers this is more than $3½ billion dollars per year.

Copies of the report showing the results of this survey are available from Benson Laboratories, Inc., Bessemer Building, Pittsburgh, Pa.

Electric Products Appoints Southern California Agents. The Electric Products Company of Cleveland 12, Ohio, has appointed the **Robert A. Young & Company,** Glendale 4, Calif., as its sales and service representatives for Southern California and Arizona. Young will handle all industrial lines of The Electric Products Company, including motor-generators.

The Mutual Electric Company has recently taken on the distribution, sales and service of Bede paint heaters in the five boroughs of New York City and is

THE WIRE COATING & MANUFACTURING CO.
395 EAST 131st ST. CLEVELAND 8, OHIO

DISTRIBUTORS
Armenia Co., Ltd. Toronto, Canada
General Supply Co. 3317 St. Clair Ave. Cleveland, Ohio
Industrial Chemical & Equip. Co. 700 11th Ave. South Minneapolis, Minn.
MacDermid Sales & Equip. Corp. Bristol, Conn.

WANTED
SALES REPRESENTATIVE
Manufacturer of Buffing Compound desires a salesman with experience and contacts in the polishing and plating field. Must have car to cover upper New York State, Connecticut and Western Massachusetts. Salary and expense account commensurate with qualifications. Excellent opportunities for the right man.
Reply to:
P-652-D, PLATING
445 Broad St., Newark 2, N. J.

PROMAT PRODUCTS

preparation
plating
protection

to help you meet today's metal finishing demands

PROMAT
TO MEET TODAY'S

WHAT THE PROMAT LABEL MEANS

PROMAT

Promat is a division of Poor & Co., one of the world's largest railroad suppliers. Backed by the extensive resources of this organization, Promat is engaged in the development, manufacture and sale of products and processes designed to improve metal finishes. Stemming from one of the most completely equipped laboratories in the world, Promat products are the result of original research. Each of the products listed on these pages constitutes a distinct improvement over previously existing products and methods. All Promat products have been proven in full production and complete data is available to substantiate performance claims. Facilities are maintained at the Waukegan plant to demonstrate Promat products and processes on a semi-commercial scale. Promat welcomes the opportunity to process any samples you may submit.

Views of the well equipped Promat laboratories. Promat produces production-proven chemicals developed by a staff of chemists familiar for many years with electro-plating problems.

PRODUCTS
METAL FINISHING DEMANDS

THE SCOPE OF PROMAT PRODUCTS

PREPARATION

Promat research has developed products which give you the truly clean surface absolutely necessary for electro-deposits to adhere properly to the base metal. Promat addition agents add cleaning power to acid solutions, speed the action, insure uniform attack and retard formation of salt films on the metal surface. They result in improved appearance and quality of the metal finish and reduce rejects.

PLATING

Promat Products for plating have these common characteristics: they are economical, easy to handle, and will out-perform ordinary products of comparable price.

ZINC. The Promat line includes acid and alkaline zinc baths as well as addition agents for purifying, conditioning and brightening.

CADMIUM. Includes electrolytes for make up and maintenance, and addition agents for brightening.

COPPER. Promat offers a complete system of cyanide copper plating processes comprising the concentrated plating solutions, brightener addition agents, and maintenance solution.

PROBRITE WHITE ALLOY (See Right)

SUPERIMPOSITION KICKER UNITS. A Promat process by which superimposed ac on dc greatly increases cadmium and copper plating efficiency. It results in improved crystal structure, better throw, faster production and other benefits.

PROTECTION

The line of Promat protective coatings represents a seven year research program into the subject of chrome films. All of the Promat films have been thoroughly tested in the field and have been proven to equal or excell any product offered for a similar purpose. Promat films for *zinc, cadmium, aluminum* and *magnesium* protect against corrosion and provide excellent paint adhesion as well. Bright, semi-bright, dull and olive-drab type finishes are available.

SOME OUTSTANDING PROMAT PRODUCTS

For Improved Cyanide Zinc Plating

Promat 99M2X zinc electrolyte is the *easiest to handle bath available*. With Promat C-42 Addition Agent, it can be operated at current densities to 200 amperes per sq. ft. without burning. Throwing power, speed and efficiency are outstanding. Yet it is economical. Promat electrolytes are available for still tanks, semi or full automatics and barrel plating.

Promat C-42 Addition Agent, in addition to permitting higher current densities, produces an excellent fine grain semi-bright deposit.

A Successful Alternate for Nickel

Probrite White Alloy. Many million ampere hours of successful production offer conclusive proof that the Probrite White Alloy Process is a fully acceptable alternate for nickel. Probrite White Alloy has come to be regarded NOT ONLY as a substitute for nickel, but as a NEW FINISH having wholly desirable characteristics of its own. It is the ideal solution to production of quality plating on automotive accessories, appliances, tubular furniture, etc. It can be used over copper, steel or die casting. It can be readily chrome plated. Production is faster than nickel, costs are comparable. It plates readily at high current densities, has high covering power and excellent corrosion resistance to red rust when chrome plated or lacquered. This process is suitable for barrel plating and still tanks—semi and full automatic.

CR-723 Buffing Grade Probrite Plating. Those platers employing the practice of copper plating, then buffing, followed by nickel and chrome plating can now obtain comparable results by using Probrite buffing grade of plating. In this system, the Probrite buffing grade of plating replaces the copper and nickel plating. It is color buffed and then chrome plated. Users report excellent corrosion resistance results. Probrite buffing grade of plating can also be used in place of buffed nickel. *Economical*. Requires only one ounce per gallon of CR-723 additive to start, then only as needed to replace drag out losses. Use standard Probrite bath with CR-723 in place of brighteners.

Proseal Chromate Finishes for Greater Protection

Probably the best known among Promat's wide line of protective coatings is PROSEAL . . . so bright, durable and highly corrosion resistant that it has been adopted by the majority of refrigerator manufacturers for the severe service imposed upon refrigerator shelving. This economical Proseal finish can be applied by simple dipping. A consistent product is assured by accurate analytical control and the bath can be maintained indefinitely. This is typical of the superior characteristics offered by all Proseal coatings.

PROMAT DIVISION, Poor & Company
851 South Market Street • Waukegan, Illinois
Distributors in Principal Cities

See Next Page for Product Listings

partial list of PROMAT products

for metal preparation

P-75 Liquid Addition Agent for the Acid Dip—gives uniform attack, retards iron salt formation and iron oxide retention in crystal boundaries.

P-76 Liquid Addition Agent for the Acid Dip—used alone or with P-75, when metal is heavily scaled. Prevents burning and produces light, stable foam head.

P-78 Liquid Addition Agent for Acid Rinse Water—sequesters iron salts, makes possible their *more complete* removal. Prevents iron oxide formation.

FOAMERS—Keep fumes down on acid tanks.

for plating

ZINC

C-42 Alkaline Addition Agent — for still, semi or full automatic plating. Dissipated by drag out only. Produces semi-bright deposit. High throwing power and high production with no danger of burning.

C-42-B Addition Agent — grain refining agent for cyanide zinc barrel plating. The highest efficiency, lowest cost agent for barrel plating ever developed.

L-105 Addition Agent — used in conjunction with C-42-B in a barrel cyanide zinc bath to produce a bright plate direct from barrel.

A-20 Addition Agent — for sulphate type acid baths. Permits high pH operation by sequestering action on iron and zinc in solution.

Doctor Solution Purifier for Zinc Baths —precipitates heavy impurities.

#9M2X Zinc Electrolyte—a completely mixed, filtered and purified two times concentrated electrolyte containing all of the standard electrolyte ingredients.

CADMIUM

Cd-69M Cadmium Electrolyte for make up.

Cd-69MS Cadmium Electrolyte—maintenance solution.

C-28 Basic and C-50-S Brightener Addition Agents — suitable for barrel, still, semi or full automatic.

COPPER

C-201M Sodium Copper Cyanide Solution—can be used as the basic solution for the sodium cyanide type of copper bath, supplying the metal, cyanide and caustic components of this bath. It may be used concentrated or diluted with water to provide an electrolyte of the sodium copper cyanide type ranging downward from a metal content of 10 oz. per gal.

C-201-C Sodium Copper Cyanide Solution—similar to C-201-M except that it contains a higher copper content and a lower free cyanide content.

C-201-MS Sodium Cyanide Maintenance Solution—contains sodium cyanide and sodium hydroxide in a highly purified form.

Prosalt Addition Agent—designed for use with the sodium cyanide copper bath to provide a high speed, general purpose type of plating solution. It eliminates all the inherent disadvantages of baths containing Rochelle Salt.

C-201-BA-1 and C-201-BA-2 Brighteners—the former is the carrier or range establishing agent and the latter is the brightening agent.

PROBRITE WHITE ALLOY PROCESS — a proven, completely successful alternate for nickel. Suitable for barrel plating and still tanks—semi and full automatics. Concentrates and addition agents.

for protection of zinc, cadmium, aluminum, magnesium

ZINC-CADMIUM

PROSEAL D-32-A—gives high lustre plus protection. Single immersion.

PROSEAL D-33—a chrome type dip that produces a soft deep finish without iridescence or blue hazing. Single immersion.

PROSEAL No. 1 & 3—produces a mirror bright protected finish that is the finest in the field where quality and appearance are paramount. Two immersions.

PROSEAL 2080—O.D. finish tops in protection against corrosion. MEETS ALL ARMY-NAVY SPECIFICATIONS.

PROSEAL D-31—general purpose, high protective value for all electro and hot dip zinc surfaces. Best painting surface ever produced when used with Promat 2A sealer.

ALUMINUM

No. A-40 protective chrome film, excellent paint adhesion, highly resistant to corrosion.

MAGNESIUM

No. M50—protective chrome film, accomplishes same results as No. A-40.

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WAGNER BROTHERS, INC.
Detroit, Michigan

Rochester, N. Y.
Don Blum

Cincinnati, Ohio
Bill Young

MAYLAND PRODUCTS CO.
Grand Rapids, Michigan

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ARDCO, INC.
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CROWN RHEOSTAT & SUPPLY CO.
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St. Louis, Missouri

CLARK CHEMICAL & SUPPLY CO., INC.
Indianapolis, Indiana

PROMAT

24M—5-52

Printed in U.S.A.

Industry News

equipped to render complete service to users of Bede equipment for hot-spray finishing. Bede heaters are sold nationally by **Bede Industrial Products, Inc.**, 1110 Brookpard Rd., Cleveland 9, Ohio.

Barrel Plating Sound Film. A 20-minute sound film showing both processing features and materials-handling applications of Stevens Full Automatic Barrel Plating Machine has been prepared and is now offered for showing to interested groups through local representatives of Frederic B. Stevens, Inc., Detroit 16, Mich.

Views taken in a customer's plant show Stevens units as part of a completely automatic materials-handling and processing installation. Step-by-step analysis of the entire operating cycle is shown by actual demonstration.

The International Organization for Standardization (ISO) will hold its triennial meeting at Columbia University in New York City on June 9-21, 1952. The announcement was made here by the American Standards Association, U. S. member of the ISO, which will act as host. Delegates from the 32 member nations will take part.

The ISO is the international clearing-house for the national standards bodies of most industrial countries. It is recognized by the United Nations as the authoritative channel through which standardization on an international level is carried out.

Job Shop Organization Suffers Split. The Chicago Electroplaters' Institute and the Masters' Electro-Plating Association, of New York City, have severed relations with the National Association of Metal Finishers, the headquarters of which are located in Detroit.

According to the Monthly Bulletin of the M. E. P. A., "the groups which have resigned, together with those [illegible] who want a change, have many more members than [illegible] N. A. M. F.".

DeVilbiss Company's Middle Eastern States District headquarters have been moved from Cleveland to Toledo. Roger F. Whitell remains as District Manager and has established offices at the DeVilbiss Company plant in Toledo.

More Trichlorethylene Available. Greatly increased supplies of trichlorethylene metal-degreasing solvents have been made possible by the company's expanded manufacturing facilities, according to Detrex Corporation, Detroit 32, Mich.

The premium-quality trichlorethylene manufactured by Detrex under the trade name Perm-A-Clor is now priced competitively with ordinary grades.

WYANDOTTE CHEMICALS

Specialists in Industrial Cleaning Products

After 432 hours in salt spray, corrosion has just begun on PRE-FOS processed steel.

"Phosphating cleaner consumption cut 25%!"

—PRE-FOS field report

And here are more field reports:

"We can run one to two weeks longer before dumping!" "Humidity cabinet resistance improved 80%!" "Best cleaning our washer has ever produced!"

Everywhere users are hailing the unchallenged superiority of Wyandotte PRE-FOS*, the sensational *new* phosphating cleaner that cleans; deposits a fine-grained phosphate coating—an ideal paint base; and prevents rust of in-process steel parts.

PRE-FOS performs in hard or soft water, can be used in spray washer or soak tank and has long solution life. It rinses freely and completely; does not corrode mild steel equipment; reduces sludging.

Read the comparative tests on PRE-FOS and four competitive products, below. Then investigate this great, new cleaner! And be sure to write us for help with *any* of your cleaning problems. We'll be happy to serve you. *Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles 54, California.*

CLEANING THE WORLD

*Reg. U. S. Pat. Off.

Product	Hours to failure in salt spray. Panels spray processed 3 minutes, 2 oz. gal., 35 lbs. sq. in. pressure, 160° F. Finished with appliance white enamel and baked; paint thickness 0.0007 inches.	Spray washer cleaning rating. 2 oz. gal., 25 lbs. sq. in. pressure, 160° F., drawing compound and heavy oil soils.	Soak cleaning rating. 4 oz. gal., 170° F., no agitation, mixed and mineral oil soils, 10-minute immersion.
A	failed—408 hours	fair	fair
B	failed—120 hours	fair	fair
C	failed—192 hours	good	good
D	failed—240 hours	poor	poor
Pre-Fos	no failure—420 hours	excellent	excellent

THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray-booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

Largest manufacturers of specialized cleaning products for business and industry

Wyandotte CHEMICALS

Helpful service representatives in 88 cities in the U.S. and Canada

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CLARK CHEMICAL & SUPPLY CO., INC.
Indianapolis, Indiana
24M—3-52
Printed in U.S.A.

Personals

J. C. Washington has been appointed Sales Manager of Inet, Inc., Los Angeles, manufacturer of direct-current power supplies and controls. He succeeds **Bert Schireson** who has left the organization to enter another field.

Formerly manager of the Albany, N. Y., office of the Line Material Company, Washington is a graduate engineer with extensive experience in technical-sales management.

Robert F. Huntley was elected President of the Cowles Chemical Company at the organizational meeting of company direc-

Huntley

tors held April 8. He succeeds **Edwin Cowles**, who continues as a director.

Mr. Huntley came with Cowles in July, 1942 as Assistant to the President, after serving as technical director for the Sealright Company, Inc. In September, 1942, he was elected to the board of directors and appointed Vice-President and General Manager. He will continue with the duties of general manager.

The stockholders at their annual meeting earlier in the day re-elected Mr. Huntley, Mr. Cowles, **C. C. Bassett** and **C. B. Lansing** to the board of directors. **David A. Gaskill** was elected to succeed **E. S. Bassett**, who is retiring after serving over thirty years on the board.

Stephen M. Martin has been appointed Mechanical Engineer of Stoats Welding Company, Meriden, Conn.

Among the companies with which he was formerly connected are Western Electric Company, Union Carbide and Carbon Chemical Corporation, and United Chromium, Incorporated. Since 1939 he has been Chief Engineer of the latter concern. Martin is a graduate engineer with the degree of Mechanical Engineer. During his professional career he has been engaged in plant layout and equipment-design activities.

Irving B. Remsen, Jr., formerly a Division Engineer of American Viscose Corporation, has joined the headquarters engineering staff of Hall Laboratories, Inc., Pittsburgh, Pa., as Consultant on waste water problems in the industrial, municipal and utilities fields. His work at American Viscose was in developing waste and

Remsen

water treatment at the firm's various plants. Previously he served four years in technical sales with Filtration Engineers.

Remsen received the B.S. degree in chemical engineering at Lehigh University, Bethlehem, Pa., in 1942, later served as an assistant supervisor with Atlas Powder Company.

Robert J. Painter is now Treasurer of the American Society for Testing Materials. He succeeds **John K. Rittenhouse**, who retired after 45 years of service. **Dorothy P. Douty** has become Assistant Treasurer.

Following graduation from Rensselaer Polytechnic Institute with a C.E. degree,

=FOR HIGH SPEED AUTOMATICS=

the NEBCO

A Super Cooled Bias Type Buff

- Vents in the holding ring permit "breathing" with more rapid dissipation of heat: cooler action—longer wear—better work.
- Engineered with automatic spacing nubs and double lip construction to guarantee perfect balance and prevent slipping.

New England Buff
COMPANY

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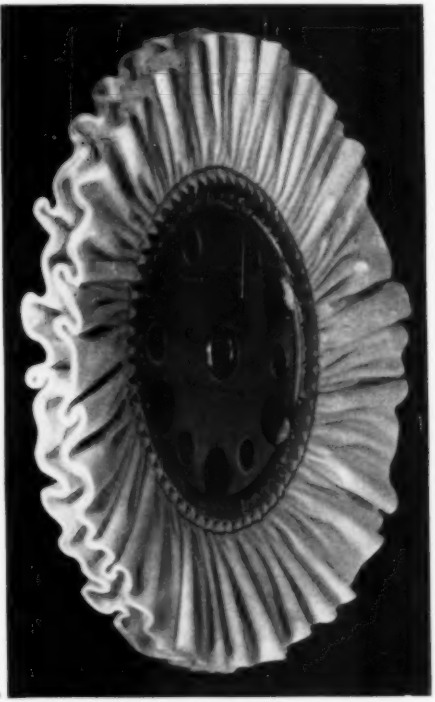


EASE OF CONTROL means faster production to Electrite. Above, Plant Superintendent J. Rodriguez racks up cadmium-plated aircraft parts. A G-E step-voltage control, obtainable for any requirement of voltages and amperes, is within arms reach.

Electrite Co. reports "No maintenance, steady production with G-E rectifiers"

SAYS "G-E PLATING RECTIFIERS ARE SIMPLEST, LOWEST-COST SOURCE OF PLATING CURRENT."

"We plate and anodize helicopter, radio and aircraft parts," says Mr. Jack Juracich, general manager of Electrite Co., Inc., "and besides accurate plating-current control, we need uninterrupted production.

"We've used G-E Metallic Rectifiers for some time now, and they have given absolutely dependable performance. They're easy to operate and need no maintenance. Also, we save money because the controls adjust power consumption to the load.

"There's no doubt that G-E Metallic Rectifiers are the simplest, lowest-cost source of plating current."

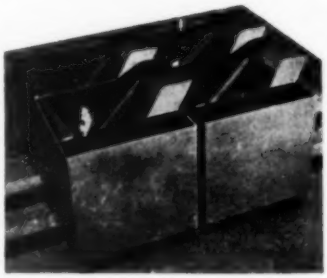
EXTREMELY LONG LIFE. Besides their many operating advantages, G-E Copper-Oxide Rectifiers are extremely long-lasting. No major part can wear out. And the copper-oxide stacks, on continuous tests, have maintained voltage stability for over 14 years! For information, write *Section 464-9, General Electric Company, Schenectady 5, N. Y.*

EASY-TO-INSTALL G-E Metallic Rectifiers are flexible, simple to maintain. Units are easily added when loads grow; no special foundations are required. Mr. Rodriguez inspecting rectifiers, says dusting is the only maintenance needed.

GENERAL ELECTRIC

For what it takes to handle products in process economically—see STORTS

THESE Stortswelded combination tank and dumpie units saved production time for our customer and lowered his costs; You may be able to make the same kind of savings by having your material handling equipment fabricated in just the right size and shape for most efficient operation. For long life and thoroughly satisfactory performance, have them Stortswelded.



42 STONE STREET — STORTS WELDING COMPANY INCORPORATED — MERIDEN, CONN.

Manufacturers of Welded Fabrications to Specification

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this trademark stands back of the Finest Chrome Plated Products

MUTUAL CHEMICAL CO. OF AMERICA — MUTUAL — NEW YORK N.Y. — SINCE 1845 — REG. U.S. PAT. OFF.

CHROMIC ACID

SODIUM BICHROMATE

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MUTUAL

CHEMICAL COMPANY OF AMERICA

270 Madison Avenue • New York 16, N.Y.

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Personals

Painter was on the Rensselaer faculty for a time, later with the Bethlehem Steel Company, and has been on the A. S. T. M. staff since 1931. He will continue to be Assistant Secretary, to which office he was appointed in 1946. He will also continue as Associate Editor of the A.S.T.M. Bulletin and handle various technical contacts as in the past.

Rittenhouse was the first full-time employee of the Society, beginning in 1909. He was closely associated with the Society's first Secretary, Dr. Edgar Marburg, and after many years as Assistant Treasurer he was appointed Treasurer in 1946.

Gilbert B. Valentine has been appointed Branch Manager of the newly established Chicago Office of Wagner Brothers, Inc., Detroit. He assumes his new position

Valentine

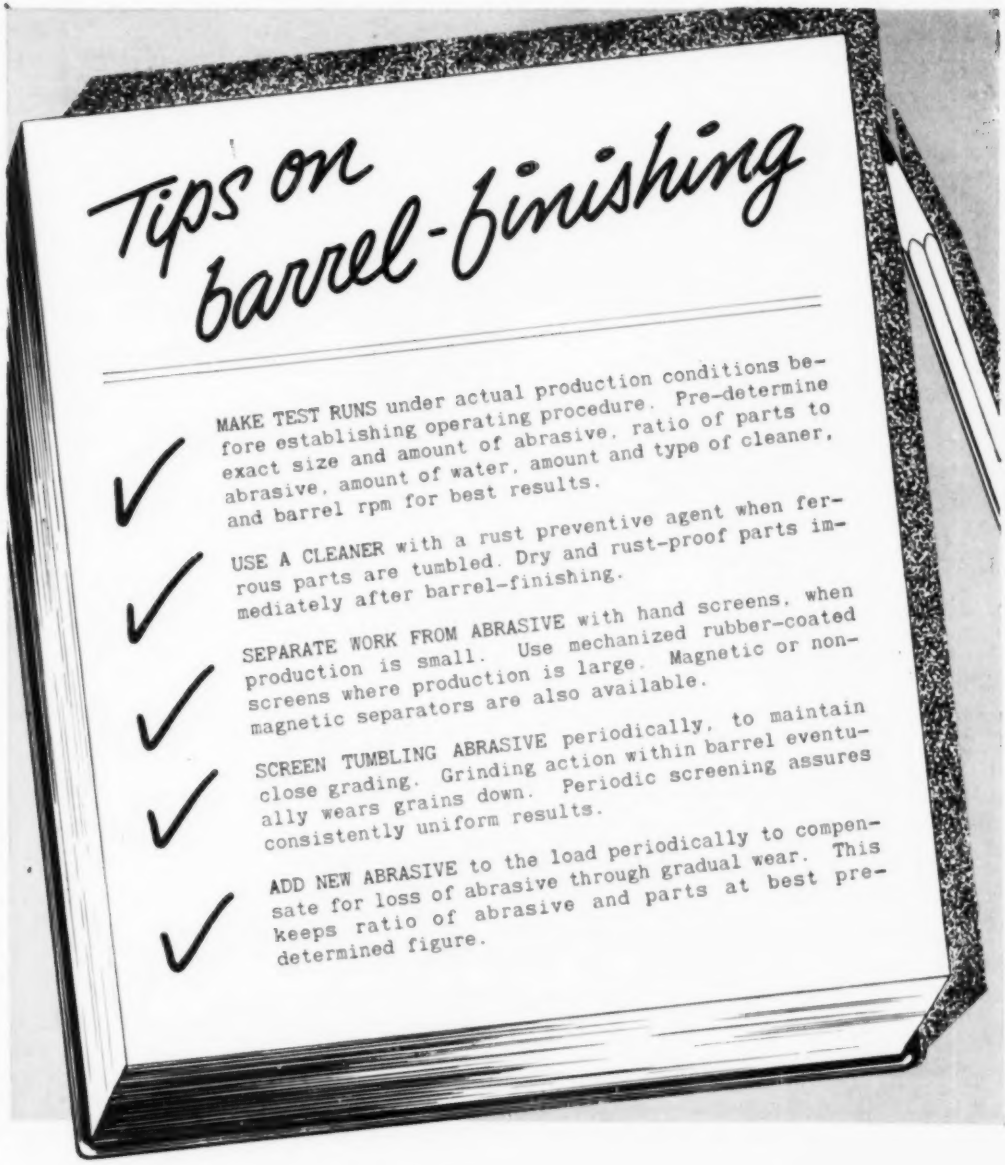
after service with the McGean Chemical Company as Sales Engineer since 1940. Prior to this he was associated with the Cleveland Graphite Bronze Company from 1938 to 1941. He then served in the U. S. Navy until 1945. Valentine is a chemical engineering graduate, holding a master's degree from the Case Institute of Technology.

Elmer L. Faber has been appointed Plant Superintendent and Head of the Engineering Department, and **Milton T. Schimmel**, Engineering Sales Manager of the Conforming Matrix Corporation, Toledo, Ohio, manufacturers of electroformed paint-spray masks and related devices.

Faber, who holds engineering degrees from Ohio Northern University and Columbia University, has served as Tool Engineer for American Propeller Corporation, Assistant Master Mechanic for Willys-Overland Motors, Inc., Director of Engineering for Ransome & Randolph Company, and Chief of Methods at Rossford Army Ordnance Depot.

Schimmel, a specialist in mold design, was Assistant Chief Engineer of Bowling Green Rubber Company and Superintendent of Manufacturers Enameling Corporation, both of Toledo.

D. R. Frankenberry is now sales representative for DeVilbiss Company serving southeastern Ohio and a western section


Tips on barrel-finishing
MAKE TEST RUNS under actual production conditions before establishing operating procedure. Pre-determine exact size and amount of abrasive, ratio of parts to abrasive, amount of water, amount and type of cleaner, and barrel rpm for best results.
USE A CLEANER with a rust preventive agent when ferrous parts are tumbled. Dry and rust-proof parts immediately after barrel-finishing.
SEPARATE WORK FROM ABRASIVE with hand screens, when production is small. Use mechanized rubber-coated screens where production is large. Magnetic or non-magnetic separators are also available.
SCREEN TUMBLING ABRASIVE periodically, to maintain close grading. Grinding action within barrel eventually wears grains down. Periodic screening assures consistently uniform results.
ADD NEW ABRASIVE to the load periodically to compensate for loss of abrasive through gradual wear. This keeps ratio of abrasive and parts at best predetermined figure.

SPECIFY Norton ALUNDUM* Tumbling Abrasive for continuous cutting action — fast, positive cut — long, productive life. If you do not have barrel-finishing equipment, let Norton make test runs for you — at no obligation. Whether or not you have equipment, get your copy of Norton's new, informative, free booklet "Barrel-Finishing with ALUNDUM Tumbling Abrasive" — full of practical hints. Ask your Norton distributor or representative for Form 501. Or write us direct.

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NORTON
ABRASIVES
Making better products to make other products better

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

Personals

of West Virginia out of Newark, Ohio. The principal industrial centers in his territory are the Ohio cities of Lancaster, Zanesville and Steubenville as well as Parkersburg, W. Va.

E. A. "Eddie" Lightfoot, who has been working from the DeVilbiss branch sales office in Pittsburgh for 20 years, will serve customers in Eastern Ohio and Northwestern Pennsylvania.

Robert J. Kamen, Jr., formerly in the Columbus, Ohio, office of DeVilbiss, has moved to Pittsburgh and is assigned to 40 counties in Pennsylvania, West Virginia and Maryland.

Andrew B. Stevens has been promoted to the position of Assistant Factory Manager of American Wheelabrator & Equipment Corporation, Mishawaka, Ind., manufacturer of dust collectors and abrasive blasting equipment. He has held the position of Supervisor of Production Control and Stores with the company for the past six years.

D. M. Hayes, of Wilcox, Crittenden & Company, Inc., Middletown, Conn., was elected President. **Frank W. Miller,** of Lehigh Structural Steel Company, Allentown, Pa., First Vice-President. **E. R. Gregory,** of Thomas Gregory Galvanizing Works, Maspeth, N. Y., Second Vice-President, and **Stuart J. Swensson,** Secretary-Treasurer of the American Hot Dip Galvanizers Association, Inc., at its 17th Annual Meeting in Chicago on March 24-25.

John P. McAdams, who has for the last four years served as a Mechanical Engineer for the Munitions Board, is now employed by the firm of Joseph Mazia, Consulting Engineers, Washington, D. C.

McAdams

A native of the District of Columbia, Mr. McAdams attended George Washington and Catholic Universities in Washington, D. C. He first worked for the Naval Gun Factory beginning in 1939 as a designer of naval ordnance. After duty with the United States Coast Guard, he began work in 1946 with the Office of Naval Material as a Mechanical Engineer. With the establishment of the Unification Act he joined the staff of the Secretary of Defense and has since been concerned with the problems of armed forces materiel standardization.

Donald E. Martin has been appointed General Sales Manager and **Dr. Thor J. G. Lonning** Director of Research and Manufacturing of the Dagmar Chemical Company, Inc., 20-year-old Glenbrook, Conn., manufacturer of lacquers, thinners and nitrocellulose solutions.

Martin joined Dagmar Chemical last August as New England Regional Sales Manager, resigning an executive sales position with the C. W. Haynes Laboratories, Inc., after a 12-year association. He will continue to make his headquarters in Springfield, Mass.

Dr. Lonning joined the company in 1949 as Laboratory and Product Development Manager. He previously had been manager of A/S Osmo Chemical Company, and assistant to the laboratory director of Nyegaard and Company, both firms in Oslo, Norway. Dr. Lonning attended the University of Oslo and received his doctor's degree in chemical engineering from Eidgenossische Technische Hochschule, Zurich, Switzerland.

Stephen A. Keller has been named General Manager of the Valve Division of Minneapolis-Honeywell Regulator Company. He succeeds **James H. Binger,** who will continue as Vice-President of the Division. **Howard MacDonald,** who has been Chief Industrial Engineer, succeeds Keller as the Division's Plant Superintendent. **Robert W. Devenport** succeeds MacDonald as Chief Industrial Engineer.

The new General Manager joined the

METALS?
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for Market Information
. . . and you'll have a service at your disposal that gathers market information on current pricings, government regulations, metal and alloy uses or possible applications —and is maintained by Belmont for the benefit and profit of the metals consuming industry. Over 21,000 now receive Belmont's helpful "Metal-of-the-Month" letters. Write to get yours—courtesy of Belmont.
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Du-Lite CHEMICAL FINISHING PRODUCTS FOR ALL METALS

CLEANING GUIDE

BASE METAL	CLEANING METHOD	DU-LITE PRODUCTS
STEEL AND FERROUS ALLOYS	1. Electrolytic 2. Soak 3. Spray Washing 4. Burnishing 5. Deburring 6. Paint Stripping 7. Vertical Tumbling 8. Emulsion	#31, 31W, 37, 39, 38 Dynaclean, #38, 31, 37, 22, 29, 24, 23, 25, 45
BRASS	1. Electrolytic 2. Soak 3. Spray Washing 4. Burnishing 5. Vertical Tumbling 6. Emulsion	
COPPER	1. Electrolytic 2. Soak 3. Spray 4. Burnishing 5. Vertical 6. Emulsion 7. Paint	
ZINC		
ALUMINUM	6. Burnishing 5. Paint Stripping	AP, NP
TIN	1. Soak	#50, 52
NICKEL PLATE	1. Electrolytic 2. Soak	#37, 31 #37

FINISHING GUIDE

BASE METAL	FINISH	DU-LITE PRODUCT
STEEL	Black Oxide	Du-Lite, Du-Lite B-Oxiblack
	Black Oxide	Cu-Salts Cu-Prep
ZINC	Black Oxide	Zi-Salts
	Black Oxide	3-0 Salts
	Phosphate	Phosteel Phosproxy
DU-LITE IMMERSION SALTS		Prepare Aluminum for Plating
DU-LITE ALUMINUM BLACKENING SALTS		Black Oxide Finish

bring your finishing problems

Du-Lite

AISLE "E" BOOTH 25

INDUSTRIAL FINISHING EXPOSITION

INTERNATIONAL AMPHITHEATRE, CHICAGO

JUNE 16-20, 1952

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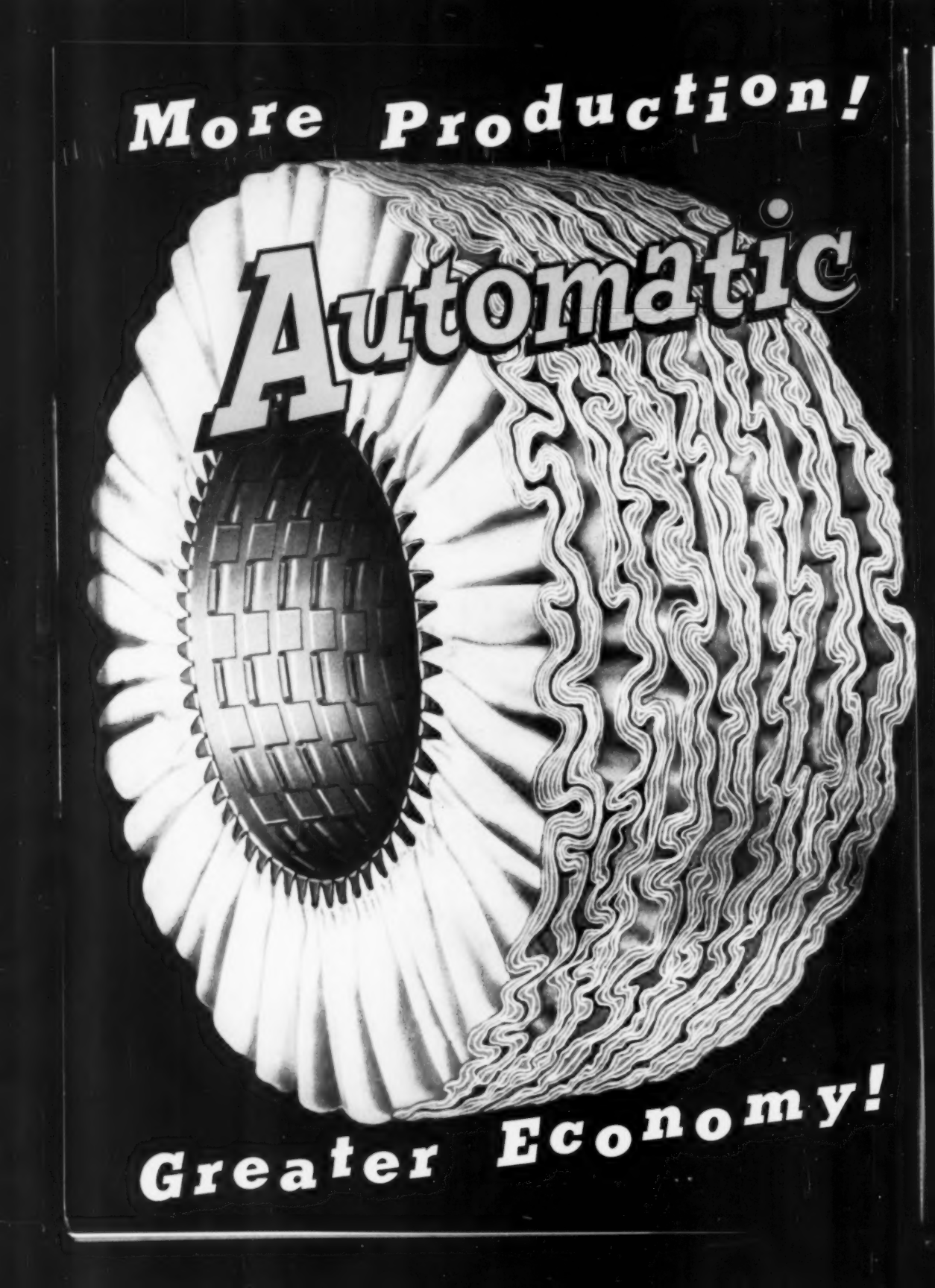
THE DU-LITE CHEMICAL CORPORATION · MIDDLETOWN, CONN.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Automatic
Greater Economy!

Centerless Bias Buffs

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outperform all others!

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"PRE-ASSEMBLY" CHANGE-OVER

Easy as A·B·C!

Lock individual buffs together to build up desired width

Insert special flanges with "telescoping" *hollow* shafts

Press shafts together —"Pre-Assembled" Unit is ready to install!

Plus THESE 4 OUTSTANDING FEATURES

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Unique, exclusive design leaves center completely open for "air-conditioned" pre-assembled set-ups.

COOLER RUNNING
Lets you work at higher machine speeds without "burning" — gets work done in fewer passes.

LOK-TITE RINGS
Grip cloth securely — lock individual buffs together in compact, non-shifting set-up.

COMPLETELY ADAPTABLE
To any size of spindle shaft — merely by varying diameter of spindle hole in the flanges.

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American Buff Company

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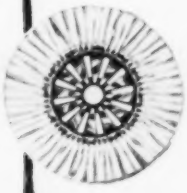


AMERICAN BIAS BUFFS
are also available with Permanent Steel Centers for special applications *at no extra cost!*

Personals

Valve Division in February of last year. Previously he had been with Wright Aeronautical Corporation for 10 years. While with Wright he held supervisory positions in manufacturing and industrial engineering.

Joseph A. Snook has been appointed Vice-President in charge of Sales of Atlas Mineral Products Company, Mertztown, Pa., and Houston, Texas. Associated with the company since 1942, he has previously served as Secretary and Purchasing Agent. A graduate of Pennsylvania State College, he was with the Duquesne Light Company in Pittsburgh, Pa., before joining Atlas.

Arnold E. Blitz has been appointed Pennsylvania Salt Manufacturing Company's Sales Supervisor in the ordnance field. He will supervise the coordination of the company's sales and service with ordnance contractors and will act as liaison between the company and the Government.

Blitz joined Pennsalt as sales-service representative last year when the company began marketing phosphate coatings and lubricants for application to steel prior to cold working. A native of Brooklyn, N. Y., he attended West Chester State Teachers College in West Chester, Pa.

Leon R. Westbrook, of Briar Hill Dr., Solon, Ohio, has severed connections with Cleveland Industrial Research, Inc., formerly Carl F. Prutton Associates, Inc., in order to devote full time to his personal consulting work in electroplating, electrochemical research and technical patents.

J. T. Cataldo has been appointed Assistant General Manager of International Rectifier Corporation, El Segundo, Calif. He received his B.M.E. degree from Clarkson College of Technology and his B.E.E. from Brooklyn Polytechnic Institute, and did graduate study at Rutgers and Brooklyn Polytechnic.

Cataldo

An employee with the Government since 1939, Cataldo served as Assistant Chief of the Instrument Section at the Material Laboratory, N. Y. Naval Shipyard, until 1948. He then joined the Signal Corps Engineering Laboratories, Ft. Monmouth, N. J., as a research-and-development engineer and unit chief.

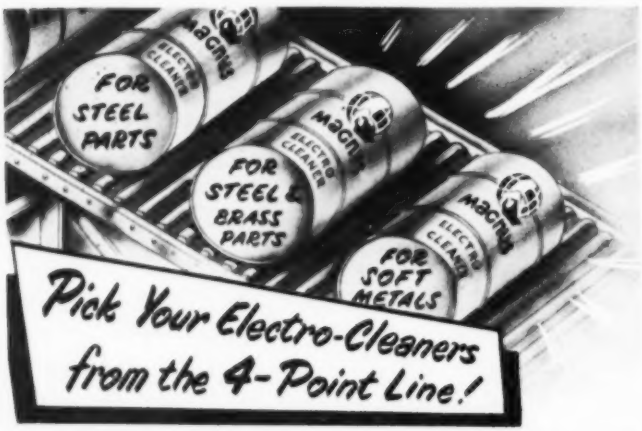
Joseph A. Sanches is now New York area District Sales Manager for Bede Industrial Products, Inc., with an office at 475 Fifth Ave., New York City. Formerly a service representative for Bede Industrial Products, Inc., he will work with Bede distributors on the Atlantic coast.

John Nuber is now Assistant Chief Engineer and **Stewart Millar,** Supervisor of Engineering Standards and Development of Detrex Corporation, Detroit 32, Mich.

Nuber is in charge of all technical phases of design and estimating for the company's Industrial Process Cleaning Division, which includes solvent-vapor degreasers and alkali washers. Millar, a graduate of the University of Detroit Engineering College, previously served with Detrex as Field Service Engineer. He will be concerned with design improvement of present industrial cleaning equipment and accessory equipment.

Dr. Foster Dee Snell, President of Foster D. Snell, Inc., consulting chemists, will receive the Fourth Annual Honor Scroll Award of the New York Chapter of the American Institute of Chemists at a dinner meeting in the Hotel Commodore, New York, on May 22.

Dr. Snell received his B.S. degree from Colgate University and was awarded his M.A. and Ph.D. from Columbia University for work in the field of organic chemistry. He was licensed a chemical engineer in 1927. Before founding Foster D. Snell, Inc., he was an instructor of general chemistry at both Columbia University and City College of New York and took charge of the technical chemistry



The electro-cleaning compound that works effectively on steel would irretrievably damage soft metal parts like zinc or aluminum. A material suitable for steel and brass combinations would not be satisfactory for all steel pieces.

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The Magnus line of electro-cleaning compounds has been designed to meet each specific condition safely and efficiently. And they have the following essential properties in common:

1—Adequate Carrying Capacity for Required Current Densities.
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3—Exceptionally Long Solution Life—Often Twice That of Ordinary Metals.
4—Concurrent Chemical Cleaning Action.

Tell us what parts you clean electrolytically. Then we can work with you in selecting the Magnus Cleaners best adapted to your needs. We'll be glad to make test runs on your various products in the Magnus laboratory so that you can see the exact results you can expect from each specific Magnus Electro-Cleaning Compound, with due attention paid to water conditions and other governing factors.

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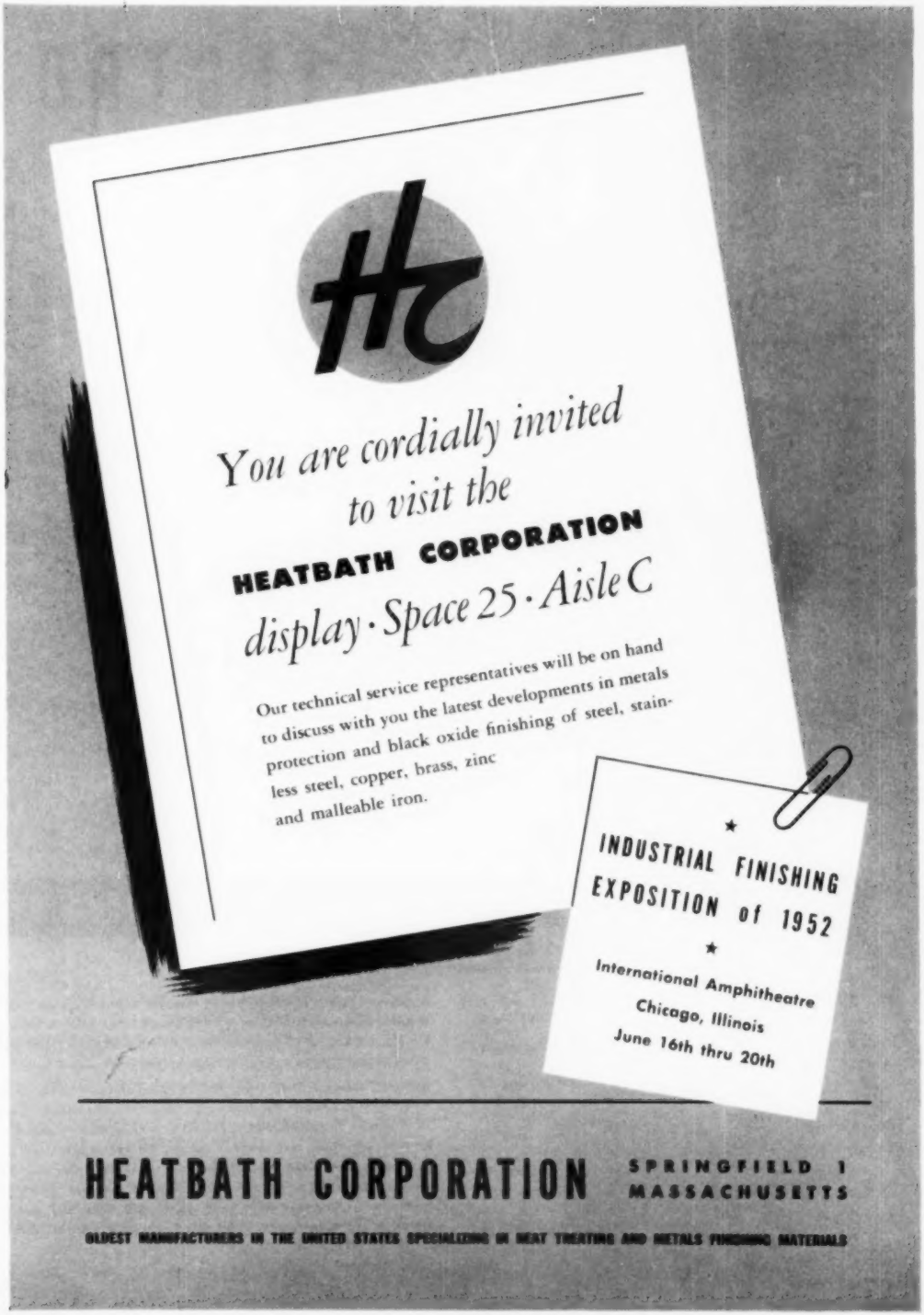
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● Nickel, Iso-Cast Oval form, cast to give optimum grain size, any length. ● Copper, the famous Flat-Top, smooth surfaced, free from silicon, dirt and oxides; Lectrocap, pure electrolytically deposited slab form, any width or length, the lowest cost form of anode; Iso-Cast Oval, electrolytic copper molded under controls eliminating ferrous contamination. ● Zinc, in the *new standard* form, Flat-Top, easily identified, clean, cast from the purest metal. ● Tin, cadmium, available in any length in the distinctive

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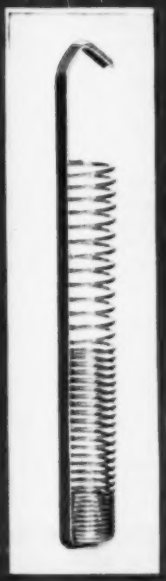

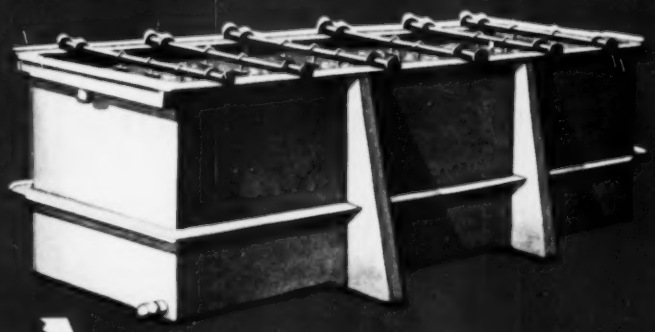

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ANODE CONTAINER with spline welded full length, has 4-point contact. Plate at bottom catches "nubs", permits free circulation of solution. Close spacing of coils avoids jamming of anodes. Special lengths and curved containers fabricated promptly. Standard sizes in stock.

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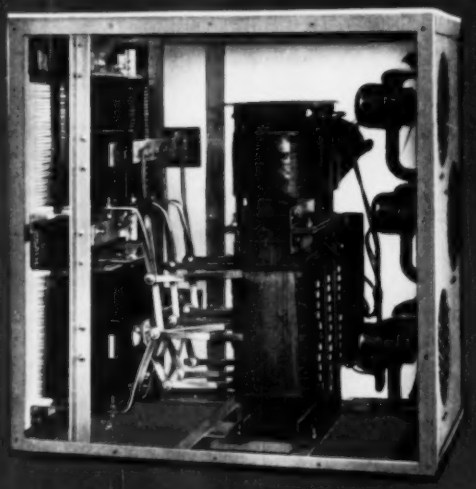
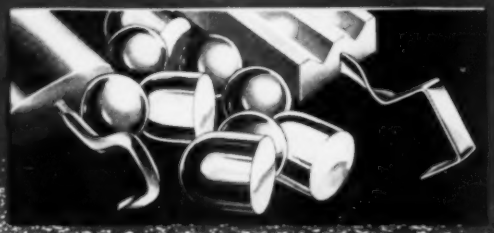
WAGNER ANODES in all metals are recognized as standards of the industry. Every Wagner Anode is a premium product.





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corrugated Iso-Cast form with locked in steel contact hook. Balls are also available. ● White brass, 80% zinc, 20% copper, available in several shapes, as required.

Wagner-Tiedeman Electroplating Rectifiers have earned a place along with other Wagner premium products. Our ratings are conservative for full efficiency and safe performance. Removable panels permit quick and easy access. Ranges are from 2 to 50 volt, 750 to 10,000 or more amperes.

Wagner tanks are being incorporated in outstanding automatic and still tank operations everywhere. We're shipping to users far from our plant and the reason is simple: our tanks are built to last, our price is fair and we are ready to handle any quantity, one or one hundred, equipped with agitators and rods as required—or we'll provide your complete plating set-up, automatic or still tank.

Along with these products and the solutions, supplies and equipment for a complete electroplating system, we offer a competent sales-and-service staff. The Wagner representatives and branch managers are men with production experience and years of electroplating engineering behind them. They are backed up by an efficient laboratory and pilot plant, manned by some of the best technicians in the industry. Most important of all, you'll find every Wagner man enthusiastic about providing service to his clients and anxious to prove his ability and the integrity of the company he represents. Want proof? Pick up the phone and tell us your troubles or drop us a line at your first opportunity.

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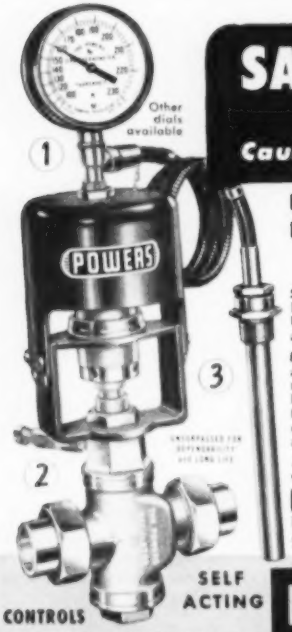

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Personals

program at Pratt Institute. In 1939 Dr. Snell was awarded the Gold Medal of the Society of Chemical Industry at its annual meeting in Manchester, England.

Jack B. Grieser has joined the sales staff of Metal Spray Corporation, Milwaukee, Wis. He has been associated with industrial accounts since 1938 and has both sales and shop experience with metallizing equipment.

George T. Collins, previously Manager of Market Research, has been elected Assistant to the President of the Pennsylvania Salt Manufacturing Company.

Graduated B.S.Ch.E. from Villanova College in 1937, he joined the Barrett Division of the Allied Chemical and Dye Corporation, first as a chemical engineer in pilot-plant work and later as a research-group leader in sales development. In 1943, he joined Pennsalt in the Market Research Department. He was named Assistant Manager of this department in 1945 and Manager in 1946.

Willard P. Cunningham is new Director of Engineering Sales of L. O. Koven

Cunningham

& Brother, Inc., Jersey City, N. J. He has been with Koven, in various sales positions, for 26 years.

L. A. Danse, of General Motors Manufacturing Staff's Production Engineering Section, has been renamed to the 6-man Water Pollution Control Advisory Board by President Truman.

Danse is chairman of the General Motors industrial waste committee. He was first appointed two years ago to the Water Pollution Control Advisory Board, which reviews United States Public Health Service policies and programs for water pollution control and makes recommendations to the Surgeon-General. He is a member of the Detroit Branch of the American Electroplaters' Society.

Obituary

✝ **J. van der Graaf,** Junior Manager of Metallic Industry N. V., Hilversum, Holland, died suddenly of a heart attack on February 27. He was a well-known member of the American Electroplaters' Society.

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Experience, not guess work, is the basis for the success of Wallace & Tiernan's alkaline chlorination installations for cyanide waste treatment.

CHLORINATION KNOW-HOW

Alkaline chlorination — now accepted as standard cyanide waste treatment practice in the metal finishing industry — oxidizes cyanides by chlorination at controlled pH values. It is effective and economical when properly applied. Since no two cyanide waste problems are the same, the method of applying alkaline chlorination varies. Based on its experience in over 100 such installations, Wallace & Tiernan is prepared to suggest the proper equipment to suit your particular plant.

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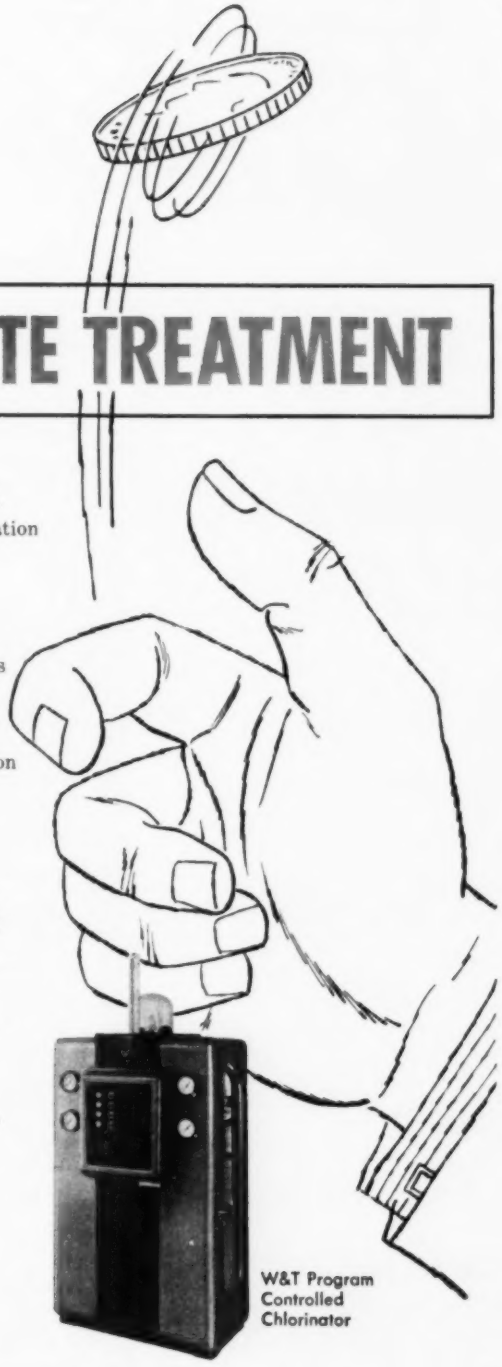
The precision chlorinators for which Wallace & Tiernan has been known for thirty-nine years have been combined with newly developed instruments to make possible the automatic control of alkaline chlorination treatment — an assurance that cyanides are destroyed — and at minimum chemical costs.
Eliminate guess work on your cyanide waste disposal — write today for further information.



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American Industry—both large and small companies—has overwhelmingly demonstrated its preference for ALMCO Supersheen Barrel Finishing Equipment and Materials.

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Here's a part that was cleaned three weeks ago—still rust-free. That's because it was cleaned and rust-inhibited, *all in the same operation*. The secret is Pennsalt Cleaner EC-51, a brand new solvent emulsion cleaner . . . and it can solve some real problems for you. EC-51 is designed to help you on your in-plant cleaning operations. For instance, with EC-51, you can clean one day, and then finish days or even weeks later without worrying about the condition of the exposed metal on the part.

EC-51 won't spot or stain non-ferrous metals, and it gives a rust-preventive surface to steel that protects these parts between processes.

For example, Pennsalt EC-51 has proved itself in one large national company on aluminum, brass, bronze and steel parts . . . cutting their cleaning cost 35%, while doing a superior job of cleaning and rust-inhibiting. EC-51 was scientifically designed for thorough removal of heavy grease and oil deposits, buffing compounds, cutting oils and other heavy soils.

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Pennsalt's new Fos Process offers you a single experienced source for application know-how, superior phosphate coating cycle, and better die protection. Write on your letterhead for more information.

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Pennsalt Chemicals

Trade Literature

L—798. Painting, Protection of Aluminum—American Chemical Paint Company, Ambler, Pa., offers a 4-page folder on "Alodine" for protection and prepaint preparation of aluminum. Both Alodine No. 100, a non-crystalline phosphate coating, and Alodine No. 600, an amorphous mixture of metal oxides and chromates, are described, and their fields of application delineated. For your copy, use Reader Service Card.

L—799. Black Oxide Finish—A reprint of an article written by A. J. Mitchell, President of The Mitchell-Bradford Chemical Company, 2446 Main St., Stratford, Conn., which was published in the March issue of Materials & Methods, has been made available by that company. It describes the coating, equipment and procedures, the blackening solution and its applications and discusses various other coloring processes. For your copy, use Reader Service Card.

L—800. Electric Controls—An 8-page selection guide GEA-5781 for a wide range of electric and electronic controls, devices, and accessories has been announced by General Electric Company, Schenectady 5, N. Y. It contains selection data, photographs, and listings of publications that give complete information about manual, magnetic, combination, and reversing motor starters; push-button stations; relays; limit switches; solenoids; photoelectric relay; electronic timer; electronic relay; pressure and vacuum switch; float switch; pressure governor; reduced-voltage starter; Thymo-trol drive; and smoke-density indicator and control. For your copy, use Reader Service Card.

L—801. Continuous Blast Cleaning—"Continuous Airless Blast Cleaning" is the subject of a Bulletin No. 844 published by American Wheelabrator & Equipment Corporation, 1180 S. Byrkit St., Mishawaka, Ind., of particular interest to shops cleaning relatively large tonnages on a production basis, it explains the process of continuous blasting and illustrates how it is being applied in practice. Because there are no stoppages for starting, stopping, loading and unloading, the method lends itself to line production, and because only one machine is involved, there is a consequent reduction in manpower and floor space, materials handling is simplified, and there is a lower power-connected load. For your copy, use Reader Service Card.

L—802. Surface Tension Measurement—Joseph B. Kushner, 115 Broad St., Stroudsburg, Pa., offers a 4-page leaflet describing his Sur-Ten Meter, a rugged instrument of an accuracy of 2–5 per cent. For your copy, use Reader Service Card.

L—803. Cleaners—Technical and practical data, relative to the nature and uses of Fine Organics' "FO" line of solvents, cleaners and emulsions are briefly, yet lucidly described in a series of AIDS bulletins just issued:

Emulsen Cleaners, Vol. 1–2
Safety Solvents, Vol. 1–4
Supplementary Technical Information, Vol. 1–5
Instrument Cleaners, Vol. 1–6

For your copies, write to the Aviation-Industrial Division, Fine Organics, Inc., 211 E. 19th St., New York 3, N. Y., and mention PLATING.

L—804. Buffing and Polishing Compounds—Publication of the third edition of its booklet on "Speedie Buffing and Polishing Compositions" has just been announced by The Buckeye Products Company, 7020 Vine St., Cincinnati 16, Ohio. It contains the latest developments in both dry and liquid compositions, and is full of information of interest to every buffing and polishing shop. For your copy, use Reader Service Card.

L—805. Lead Clad Steel and Copper—The Research Department, Knapp Mills, Inc., 23-45 Borden Ave., Long Island City, N. Y., offers a 22-page illustrated publication, "The History and Development of Ferrolum Lead Clad Steel and Cupralum Lead Clad Copper". Following a history of the use of lead in the chemical industry, the booklet describes the Ferrolum and Cupralum products and

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MODEL 880 Single Speed, Two Spindle—Two Motor Polishing and Buffing Lathe. Each spindle can be driven at speeds from 1800 to 3600 RPM.
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Production Problem:

Grind and finish shotgun barrels in one high-speed operation

1 Winchester Repeating Arms Co., New Haven, Conn., turned this grinding and finishing problem over to a 3M Methods Engineer who used his wide knowledge of coated abrasive applications, and came up with a solution.

2 His answer to this problem was a conversion to backstand equipment with fast-cutting abrasive belts. A backstand idler was also recommended—plus the correct abrasive belt, proper grit size and most efficient operating speed.

3 Now Winchester uses the 3M Method to rough grind and finish shotgun barrels more than twice as fast as with their previous method of using set-up wheels—with smoother finishes, too!

4 3M Methods Engineers, in demonstration rooms throughout the country, are ready to help *you* cut grinding and finishing costs. For more information and a copy of "Step Up Production," write: 3M, Dept. PL62, St. Paul 6, Minnesota.

Made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, St. Paul 6, Minn. —also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Adhesives. General Export: 270 Park Avenue, New York 17, N. Y. In Canada: London, Ont., Can.

(Patent Pending)

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The Forcite Anode Basket is expressly designed for efficient, complete solution of scrap or ball anode material. It may be used in nickel, acid copper, lead, and all cyanide baths. It dissolves all anode material to the last ounce.

Fabricated from reinforced steel, the Forcite Anode Basket is completely coated with an inert, insulating material. Its tapered construction is ideally suited to give continuous electrical contact to the anode mass without requiring replacement of "contact" anodes. Contact is made by perfectly shielded, inert graphite blocks the entire depth of the basket and coupled to the anode bars. Cotton bags are included.

Forcite Anode Baskets are available in either 24" or 30" lengths; other lengths on special order.

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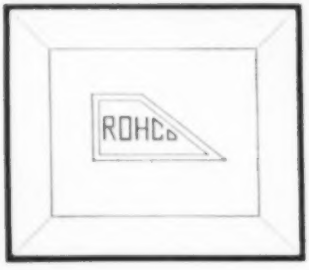
BOOTH SPACES P5-6



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Gentlemen:

Please send details and prices on the NEW FORCITE ANODE BASKET

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- ☐ ROHCO 100 BARREL ZINC BRIGHTENER for brilliant deposits, maximum coverage and lowest cost.
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- ☐ ROHCO ZINC PURIFIER to keep zinc baths in tiptop shape.
- ☐ NO-FLASH to control foaming and explosions in most plating baths and alkaline cleaners (except chrome).

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- ☐ ROHCO NO-CRO-MIST® controls chrome fumes; solves ventilating and heating problems; saves chromic acid.
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- ☐ HULL CELLS AND RECTIFIERS for speedy, positive catalyst control.

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- ☐ ROHCO Imperial SILVER BRIGHTENER is far more effective than the usual brighteners; gives lustrous, satin finish, increases production up to 2½ times normal.

FOR ALL PLATING

- ☐ ROHCO RINS-AID sheds water; improves drying; prevents staining.
- ☐ COMET RECTIFIER is the newest, most convenient rectifier; dual range 6 and 30 amperes, perfect voltage control, filtered output, automatic timer. Other rectifiers are B-1000 and B-267.
- ☐ HULL CELL UNITS are plating test sets universally accepted for control of plating baths.
- ☐ FORCITE ANODE BASKETS offer the latest and best means for using scrap metal or ball anodes. Two positive, inert, shielded contacts from anode bar to ALL the metal.
- ☐ ADDITION AGENT PUMP feeds any liquid in continuous, small amounts to as many as four plating tanks.

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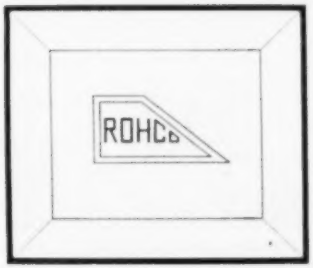
1302 Parsons Court, Rocky River 16, Ohio

Canada: Armalite Company, Ltd.
Toronto 6, Canada

"YOUR PLATING IS BEST WITH THE HULL CELL TEST"



Trade Literature

their uses and compares them with straight lead. Of special interest to platers are the discussion of heating and cooling coils and of anodes. For your copy, use Reader Service Card.

L. 806. Cleaning—A revised edition of the "Oakite Plant Maintenance Digest", reviewing materials and methods for performing 54 maintenance cleaning and related tasks in factories and mills, has been announced by Oakite Products, Inc., 140 Rector St., New York 6, N. Y.

Among the many operations covered in detail are the following: maintenance of air-conditioning equipment, cleaning-descaling of heat exchangers; cleaning of lathes, drill presses, machine tools; electrical-department cleaning; cleaning and stripping of motor housings; cleaning of conveyor belts; filter cleaning; floor maintenance; oil, grease and dirt removal from large equipment; derusting of metal parts; preventing rust in hydraulic systems; stripping paint from metal; paint-spray-booth maintenance; steam-detergent cleaning, cleaning-descaling of water-cooled transformers; cleaning of unit heaters; and cleaning of painted walls and woodwork. For your copy, use Reader Service Card.

L. 807. Magnetic Tools—Technical Bulletin M-30, issued by Magnetool Division, Multifinish Mfg. Company, Dept. 484, 2114 Monroe, Detroit 7, Mich., presents illustrations, specifications and prices of 16 hand-operated permanent-magnet tools, for handling, salvaging, sorting, separating, detecting, cleaning, extracting, loading, holding, inspecting, retrieving, and protecting parts, for labor-saving, safety and metal conservation. For your copy, use Reader Service Card.

L. 808. Belt Polisher—The George F. Grant Company, Inc., West Newton 65, Mass., announces the development of a versatile grinding, finishing and polishing unit available in two models, the U M-60, 2½ x 60 inches, and U M-45, 4 x 60 inches.

The Grant Model U M-60 Universal Grinder, Sander and Polisher shown herewith was designed for small parts that must be ground, finished, polished, deburred, etc. It features platen-supported belt grinding, concave and convex contour grinding and polishing, and ¼- to 1½ inch-radius grinding and polishing. With internal grinding attachments it is capable of doing areas from 5/8- up to 2-inch ID.

The grinder can be rotated 360 degrees and has automatic locking at every 90 degrees. In addition, it has three standard positions of operation: (1) vertical (as shown), (2) horizontal, and (3) perpendicular. For your copy of a descriptive bulletin, use Reader Service Card.

L. 809. Aluminum Literature and Movie Index—Reynolds Metals Company, Desk "A", 2500 S. 3rd St., Louisville, Ky., has published an index listing technical literature and motion pictures available to the metalworking industry.

Technical literature is listed under five different headings: Design; Fabrication; Application; Products; and General Information — all having to do with how to use aluminum most effectively.

In addition, seven 16-mm motion pictures are listed, most of them in sound and full color. For your copy, use Reader Service Card.

L. 810. Dipping Baskets—The Hanson-Van Winkle-Munning Co., Matawan, N. J., offers Bulletin D-108 on "Dipping Baskets" for use in immersing objects in electrocleaning and electroplating solutions. The bulletin covers 12 standard-style wire baskets and includes 3 tables giving dimensions of 27 round, 7 tray, and 22 rectangular models in 4

A FEW OF THE MANY
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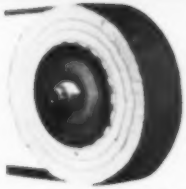

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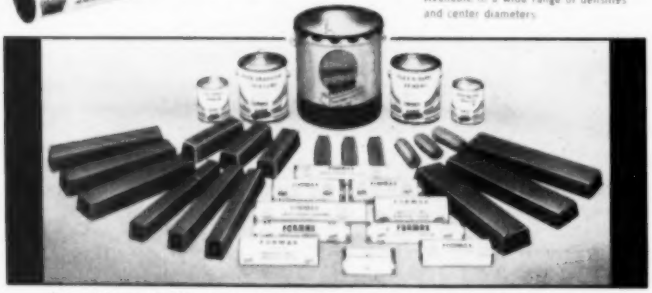
CONTACT WHEELS
and F-26 Belt Lubricant

A C-20 Flexible Contact Wheel will form itself to the shape of the work and permit the abrasive belt to polish contoured surfaces and F-26 Abrasive Belt Lubricant will increase belt life by preventing loading and glazing. Produces finer, smoother and brighter surfaces through lubrication.

ZIPPO BUFFS

These famous long wearing buffs run cool under all buffing conditions. Constructed of high count bias cut cloth or sisal mounted on safe steel centers. Available in a wide range of densities and center diameters.



A complete line of buffing compounds in bar form as well as in liquid form for brush or spray application. Also Flex-A-Cio polishing wheel cements.

Our Laboratory and Sales Engineering staff would welcome the opportunity to be of help in solving your finishing problems.

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UNICHROME
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Unichrome S.R.H.S. Chromium Solution works a

Big Improvement in Hard Chromium Plating

Lower temperature copper bath usable in nickel tanks

Especially important to the plater substituting copper for nickel is the fact that Unichrome Pyrophosphate Copper Bath, operating at only 110° to 140° F, can be used in nickel tanks with rubber or plastic linings.

Saving the cost of converting the tank is not the only benefit. The Unichrome Copper Process maintains a wide plating current range, and without brighteners, deposits a smooth plate excellent for direct plating with chromium. It contains no cyanide to dispose of. Bulletin CU-2 gives more data.

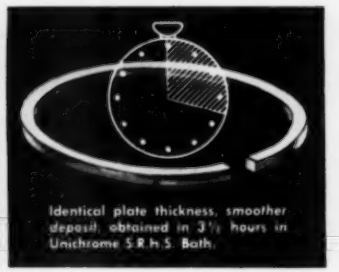
EFFICIENT INSULATION ASSURES MORE EFFICIENT PLATING

Use of proper insulations not only improve plating results but also saves current and metals. Unichrome Stop-Off Compounds and Lacquers are noted for ease and economy of application on the work to be plated; Unichrome Coating 218X for the long lasting protection it gives to racks despite the toughest plating and cleaning cycles.

Tantalum Coils Last and Last

Installing a Unichrome Heating Coil or Heat Exchanger with tantalum tubes is good economy. Giving trouble-free service in acid baths for remarkable periods of time, the tantalum virtually eliminates maintenance, downtime and loss of valuable plating production. At one plant, a tantalum coil has already seen 4 years of service and is still as good as the day installed.

Piston rings plated to thickness specifications in ordinary chromium bath took 5 hours.



Identical plate thickness, smoother deposit, obtained in 3½ hours in Unichrome S.R.H.S. Bath.

■ There's a big difference in the hard chromium plating operations of many plants nowadays. It has been simplified, speeded up, and consistently better results assured – all through installation of the Unichrome S.R.H.S. Chromium Bath. The improvements reveal themselves in many ways.

A REAL GAIN IN OUTPUT

Especially in hard chromium plating, where it often takes many hours to deposit the specified thickness of chromium, the higher plating speed of S.R.H.S. Chromium works wonders. Cutting plating time by 20 to 50%, it helps to boost production without extra equipment. For example, piston ring plating takes 3½ hours now, instead of the 5 it used to at one plant. Another plant plates .005" of chromium on steel bushings in 2½ to 3 hours – half the usual time – by using a Unichrome S.R.H.S. Chromium Bath. And the deposit is smoother, too.

MANY PRODUCTION ADVANTAGES

Unichrome S.R.H.S. Chromium Solution deposits chromium with less "treeing". Its "leveling action" also assures a smoother plate. Both these features mean less need to deposit excess chromium to allow for grinding and final finishing–thereby saving additional plating and production time.

As a self-regulating bath, Unichrome S.R.H.S. Chromium not only minimizes control problems, but also maintains top throwing power and reduces rejects.

LOSS OF FATIGUE STRENGTH MINIMIZED

Chromium plating is known to reduce fatigue strength of steel. Recent research has proved, however, that parts plated in the Unichrome S.R.H.S. Chromium Bath have the smallest loss of fatigue strength. Here are some results on heat-treated test specimens plated with 0.001" of chromium as reported by an independent laboratory:

Chromium Plating Solution	Fatigue Strength psi	% Loss Over Unplated
Unplated	81,500	—
Ordinary	60,500	25.7
SRHS CR-100	75,200	7.7
SRHS CR-110	75,300	7.6

* * *

Write or phone the nearest United Chromium office for more information on getting better chromium plate for defense or industrial applications. Electroplating engineers will be glad to show you how you can meet specifications in less time and with less trouble by means of the S.R.H.S. Chromium Bath.

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STANDS UP THROUGH THE YEARS

In our message to the plating industry last year, we used the oak tree as a symbol of growth. But the oak represents much more than that — it also means *durability . . . soundness of design . . . integrity in construction.*

These are the qualities of Rapid Electric products which you have been putting to the severest test— the test of time. We know this test is proving that, like the oak, Rapid equipment *stands up through the years.*

RAPID

distributors in major cities

FOR BETTER PLATING

The past year has also seen continued development of Rapid Electric automatic rectifier controls. A wide variety of equipment is available to perform such functions as: voltage or current stabilization; on-off timing; automatic voltage stepping; periodic reversing; complete programming.

The next time you are thinking about adding rectifier capacity, consider the advantages of including automatic controls in your specifications. They quickly pay for themselves through savings in labor, finishing time, and spoilage . . . and in more uniform quality of the final product.

Self-contained anodizing rectifier

With automatic voltage stepping at timed intervals, and stabilization of output during the final constant-voltage stage. Can be designed to shut off after one cycle of operation, or to repeat, as desired.

Periodic reversing control

Inserted in the DC line, it reverses the current to the plating tank at accurately timed intervals. Wide timing range in both directions. Field circuit reversers also available for periodic reversing of DC generator outputs.

Remote control voltage regulator

Saturable reactor type of control permits smooth and continuous variation of rectifier outputs up to 20,000 amperes and more. Voltage or current stabilization can be incorporated.

SEE THIS AUTOMATIC EQUIPMENT ON DISPLAY IN BOOTHS E8-9 AT THE INDUSTRIAL FINISHING EXPOSITION

ELECTRIC CO.

2881 MIDDLETOWN ROAD, NEW YORK 61

Trade Literature

available wire sizes and 6 different meshes. A concluding section is devoted to special baskets of sheet-metal, rubber-covered, and scrap-anode types. Perforation sizes and dimensions are given for sheet-metal and rubber-covered baskets, and 8 different sizes of expanded-metal scrap-anode baskets are tabulated.

A chart indicates when to use steel, brass, aluminum, monel, nickel-chromium, stainless-steel, or rubber-covered baskets for acid dips, alkali cleaners, bright dips, cyanide dips, and etching. For your copy, use Reader Service Card.

L—811. Non-Chemical Water Treatment—According to Heller Laboratories, 196 Morgan St., Jersey City 2, N. J., a water-treatment process and equipment called "Hydrotron" eliminates scale in heat-exchange equipment by changing water electro-physically, so that minerals contained in the water crystallize out in the form of a sludge or slurry and do not form a dense hard coating over heat exchange surfaces. The sludge formed can be removed by the usual methods of blowdown. The process is suitable for treatment of fresh water or salt water.

This new electrical-water treatment process and equipment is said to have been used widely and with complete success in Great Britain since World War II. Known as "Aquastat" in the United Kingdom, there are now over 20,000 installations.

The equipment consists of a bronze pipe unit, installed in the water supply line, and an electrical control unit, which is mounted in a convenient position nearby. For your copy of a descriptive bulletin, "Control of Hard Scale", use Reader Service Card.

L—812. Barrel Finishing Compounds—Various products and their characteristics, applications and advantages are presented in an illustrated catalogue issued by Blue Magic Chemical Specialties Company, 2135 Margaret St., Philadelphia 24, Pa. Special-purpose compounds in concentrated paste and powder forms have been designed for deburring, cleaning, polishing, burnishing and lusterizing of nonferrous and ferrous metal castings, stampings and other parts that can be barrel tumbled. Case histories of time savings are given, and offers are made of laboratory facilities for trial runs and working samples for test. For your copy, use Reader Service Card.

L—813. Platers' Cleaners—Kelite Products, Inc., 1250 N. Main St., Los Angeles 12, Calif.; 3401 Touhy Ave., Chicago, 45, Ill.; 81 Industrial Rd., Berkeley Heights, N. J., offers a 6-page illustrated Bulletin 121 which describes the company's line of cleaners for all types of metals, as well as a variety of other metal treatments. For your copy, use Reader Service Card.

L—814. Airblast Cabinets—Catalog 31-A showing the company's line of airblast cabinets in various sizes has been published by American Wheelabrator & Equipment Corporation, 1180 S. Byrkit St., Mishawaka, Ind. These cabinets are small unit-type machines for cleaning small lots of work that can be manipulated by hand and the production of which is not large enough to justify more extensive cleaning facilities. These cabinets are available in both suction-type and pressure-type models, and one of the suction-type models can be used where limited space dictates a bench mounting. For your copy, use Reader Service Card.

L—815. All-Purpose Barrel Burnishing Compound—A barrel-burnishing emulsion, Blue Magic No. O-221, developed by Blue Magic Chemical Specialties Company, Philadelphia 24, Pa., is said to produce a hand-buffed appearance on any metal with any tumbling medium and in any standard barrel-finishing equipment suitable for wet tumbling. It will cost a cutting medium, such as Alundum tumbling abrasive, and make it a burnishing medium. The product may be used re-

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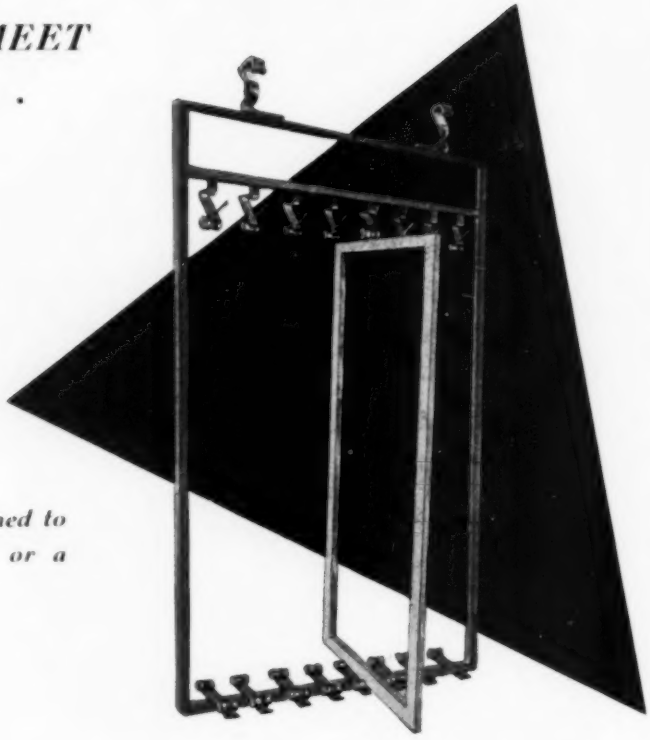

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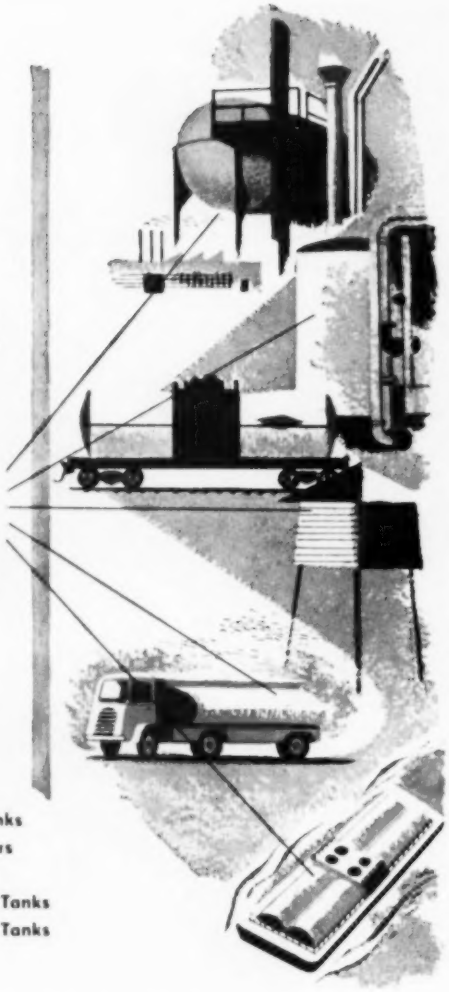
corrosion
costs
with
SARAN RUBBER TANK LINING



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Saran rubber can be applied easily and economically by experienced tank lining applicators located strategically throughout the country. Investigate this superior tank lining today. Contact your nearest Saran Lined Pipe Company office and find out how you can add years to the life of your costly equipment.

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PRODUCT

Trade Literature

peatedly. It mixes readily with water, has no objectionable odor, is not irritating to the skin, and can be removed completely from cutting or other work by a simple water rinse. For your copy of an illustrated bulletin, use Reader Service Card.

L—816. Heavy Duty Overhead Cable Conveyor System—The successful application of overhead-monorail cable-conveyor systems to heavy-duty as well as light-weight materials-handling purposes,

made possible by the development of the "split" nut and trolley-bracket assembly, is described in a bulletin on D-G Cable Conveyor Systems issued by Daigle-Gaboury, Inc., 20175 John R, Detroit 3, Mich. It is stated that trolley brackets have withstood "pull loads" up to 10,800 lb without indications of slipping. For your copy, use Reader Service Card.

L—817. Anchor Bolts Setting, Concrete Floor Repair—The Hallemite Manufacturing Company, Dept. P-7, 2446 W. 25th St., Cleveland 13, Ohio, offers an illustrated folder which describes how machinery, hand rails, seats or equipment of any type can be fastened to concrete by means of anchor bolts and how chuck holes and breaks in concrete floors can be repaired with Por-Rok Quick Setting Cement.

Replacing lead and sulfur for most bolt-setting operations, it is applied cold so that there is no heating hazard. Within 15 to 30 minutes the cement sets hard; bolts are securely anchored, patches are ready for light traffic in 15 minutes, normal trucking in 30 minutes, heavy loads in one hour.

Por-Rok is said to be self-bonding, self-levelling, oil-resistant, and not to shrink. For your copy, use Reader Service Card.

L—818. Laboratory Water Demineralizer—A descriptive folder, Series L52, issued by A. E. Tomkin & Company, 1828 Columbia Rd., N. W., Washington 9, D. C., includes a general description and information about the operation of the Hydrion Demineralizer units for the conversion of ordinary tap water to water of

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Eliminate Solution Tank and Rinse Tank Film . . .
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no. 101

Diversey No. 909 is an outstanding heavy duty soak tank cleaner for removing buffing compound from sheet and cast brass prior to electrocleaning! No. 909 cleans rapidly, easily, thoroughly, safely, saving up to 50% of cleaning costs!

Diversey No. 101 is an amazing new alkaline material developed specifically for the electrocleaning of brass prior to plating! No. 101 has excellent detergent and emulsifying properties! It does not stain or darken the metal! The superior water softening action of No. 101 eliminates film in the solution tank and rinse tank!

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The advantage of better, more thorough cleaning and savings in time and money assured with Diversey No. 909 and new No. 101 is yours for the asking! Write today for technical bulletins and other information. Better still, have a Diversey D-Man call and demonstrate the outstanding features of this cleaning team for brass!

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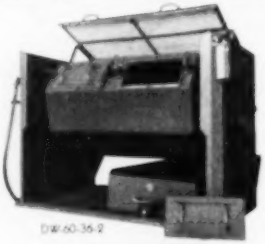
put your precision finishing on a mass production basis

SAVE MANHOURS AND MONEY . . . the original Roto-Finish processes completely eliminate hand finishing in most instances. GET ABSOLUTE UNIFORMITY . . . in any quantity. MAINTAIN exact tolerance on precision parts. CUT FINISHING costs as much as 80% . . . this fact has been proved many times in actual installations. LOWER INITIAL AND MAINTENANCE costs . . . you need only one Roto-Finish machine to replace several manual grinding or polishing machines. No exhaust system is ever required.



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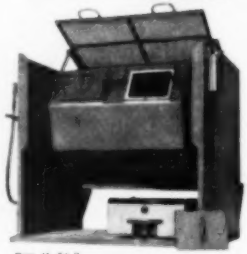

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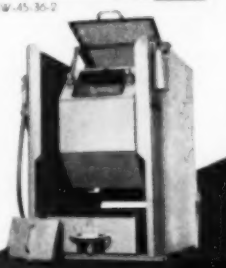


ROTO-FINISH COST-FREE ENGINEERING SERVICE GUARANTEES RESULTS!

Send a few unfinished parts to us . . . plus a finished part for a guide, (or we'll be glad to pick them up from your plant) for a "no charge" demonstration. Then sit back and let us *prove* that Roto-Finish will finish your parts . . . to your specifications . . . and save you time and money. We *guarantee* that you can get the same results in your plant that we produce in our laboratory. *There is no obligation for this service.*

Write for fact-packed Roto-Finish Catalog for complete information.

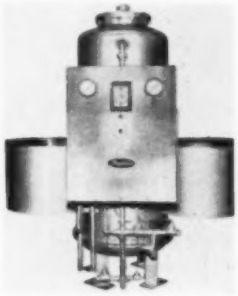
Roto-Finish COMPANY

FOREIGN REPRESENTATIVES: CANADA — Windsor — Roto-Finish Canada Limited • ENGLAND — London — Roto-Finish Limited — 39 Park Street — Mayfair • AUSTRALIA — Melbourne — A. Flavell Pty, Ltd. • HOLLAND — Delft — N. V. Roto-Finish Maatschappij — Rotterdamse — WEG 370A • AUSTRIA, GERMANY, SWITZERLAND — Frankfurt a.M. — Metallgesellschaft A.G., Germany • ITALY — Milan — Societa Roto-Finish a R.L. — Sesto S. Giovanni — Viale E. Marelli 31 • FRANCE — Paris — Societe Roto-Finish, 70 rue de la Republique-Puteaux (Seine) • BRAZIL — Rio de Janeiro — Commercial E. Industrial de Formas Werco, Ltds.

Trade Literature

the ionic purity of distilled water. There are included details, specifications and performance data for both the 5 gal/hr Service model (C5H-S) and the 10 gal/hr General model (C5H-H), with lists of representative users and suggested fields of application. The effluent water is delivered continuously or intermittently from these faucet-attached units. The Service model utilizes lower cost refills. Refills upon exhaustion are simply discarded, and a new refill is charged into the unit. For your copy, use Reader Service Card.

L—819. Automatic Mono-Bed Demineralizer—The Penfield Manufacturing Company, 19 High School Ave., Meriden, Conn., has announced the addition to its



demineralizing equipment line of a fully automatic mono-bed unit. There are no valves to operate, and no supervision is required. Whenever the effluent conductivity falls below standard, the treated water is automatically discharged and lights (or other warning system) signal the need for activation of a regeneration cycle. The turning of a single switch then puts the unit through its regeneration cycle, including rinsing and recutting in the effluent when desired resistivity (purity) is reached; the regenerative tanks are automatically refilled with water so that fresh acid and caustics may be added in preparation for the next regeneration cycle.

Available in flow rates from a few to 5,000 gal/hr and up, the demineralizer provides an effluent with a mineral content of virtually zero (resistances have been reported as high as 20,000,000 ohm-cm). For complete catalog information, use Reader Service Card.

L—820. Control Instruments—The Bristol Company, Waterbury 20, Conn., has published a Bulletin No. P1245 describing its line of Dynamaster Electronic Potentiometers and Bridge Instruments for industrial plant, pilot plant, process, research and laboratory use. The 36-page bulletin gives information concerning a

number of new electronic instruments for recording and indicating such variables as temperature, *pH*, speed, voltage, power, current, smoke density, thickness, strain, and a wide variety of other variables which can be measured in terms of d-c current, d-c voltage, resistance, or capacitance. For your copy, use Reader Service Card.

L—821. Goggles—A Dust and Splash Goggle, Style No. 501, is included in the line of cup-type goggles recently introduced by Fendall Company, 4631 N. Western Ave., Chicago 25, Ill., for use in

chemical and other industries. Indirect ventilation is obtained through baffled 2-piece anodized-aluminum sideshields, and facial fit increases safety by eliminating gaps or openings. The goggles are equipped with ball-chain nose bridge having quick-acting lever-type lock for easy adjustment; free-turning screw-type lens rings of anodized aluminum for easy lens changing; adjustable long-stretch headband. For your copy of descriptive bulletin, use Reader Service Card.

L—822. Alkaline Stripper Addition. Klem Chemicals, Inc., 14401 Lauson, Dearborn, Mich., has produced a 4-page illustrated folder describing "Strip Aid" and the advantages it offers industry in speeding the removal of paints, enamels, lacquers, etc., from conveyor hooks and equipment and from parts. For your copy, use Reader Service Card.

L—823. Process Controllers—Eight basic types of the Model 40 Controller are described in a 32-page Bulletin 461 issued by The Foxboro Company, 26 Neponset Ave., Foxboro, Mass. They are Single Action, Dual, Duplex, Auto-Selector, Ratio, Relation, Pneumaticset and Time Schedule. Thus, with its standard specifications, or available modifications, every Model 40 instrument can be specifically engineered to its application, whether controlling temperature, pressure, flow, *pH*, conductivity or some other process variable.

The new bulletin contains 114 illustrations and diagrams, helpful in understanding and applying the advanced principles of automatic control. Each instrument is pictured with a typical process diagram and a characteristic chart record. For your copy, use Reader Service Card.

flexibility in

MEAKER DESIGNS meet every PLATING REQUIREMENT

ANODIZING
BONDERIZING
PICKLING
LEAD PLATING
CADMIUM PLATING
NICKEL PLATING
CHROMIUM PLATING
SILVER PLATING
CHEMICAL PROCESSING
COPPER PLATING
ZINC COATING

Mechanized handling in the different sequences is the basis of profitable production plating. In the MEAKER designs of automatic plating machines this handling is flexible so that adjustments and modifications are easily made to meet practically every plating requirement. Too, the simple rugged construction insures uninterrupted schedules and minimum maintenance costs.

Get full particulars to meet your plating requirements from The Meaker Company, 1639 South 55th Avenue, Chicago 50, Illinois.

MEAKER

- Full Automatic and Semi-Automatic Electroplating Equipment
- Strip Steel Plating Equipment
- Wire Galvanizing Equipment
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- Pickling Machines
- Processing Conveyors
- Motor Generators for Plating
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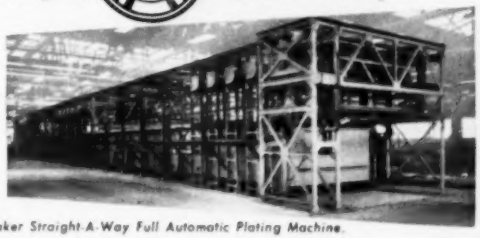
MEAKER PRODUCTS

PLATING EQUIPMENT FOR OVER 50 YEARS



A Meaker Straight-A-Way Full Automatic Plating Machine.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 747.

Revolutionary last year... superior to other contact wheels 2 to 1... Abrasive belts grind faster, last twice as long, stay free from glaze

...Still More Revolutionary TODAY!

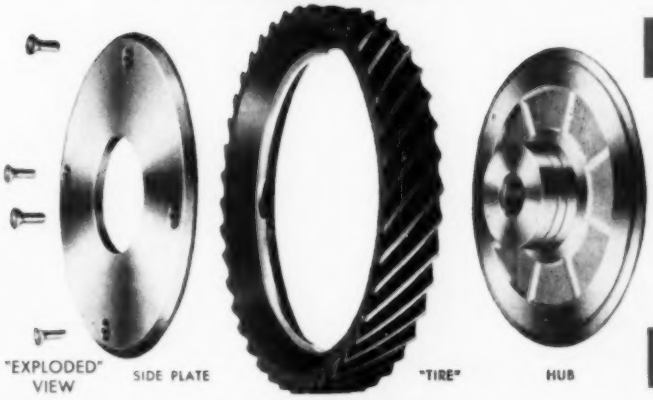
NEW "T-61" UNIVERSAL HUB CONTACT WHEEL

Look to CARBO

TRADE

"Carborundum" is a registered trademark of The Carborundum Company, Niagara Falls, N. Y.

SERRATED "TIRE"

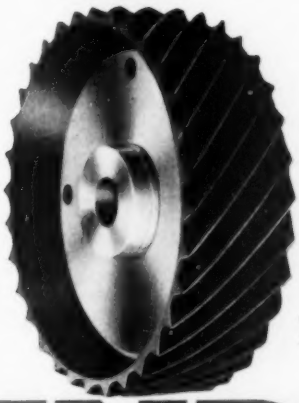


"EXPLODED" VIEW

SIDE PLATE

"TIRE"

HUB



COMPLETE ASSEMBLY

WHAT New "T-61" Hub Wheel can cut your contact wheel replacement costs squarely in half.

HOW Three part, simple assembly...Universal Hub and Side Plate—"T-61" serrated rubber "tire". When "tire" wears out, throw it away and replace with new tire at half the cost of entire new wheel.

WHY Fast, flawless interchangeability. A single Hub will take 144 different tires of various width-and-hardness combinations. Each part of assembly is separately balanced—positive, perfect performance in any combination of Hub, tire and plate.

WHERE Everything from the roughest stock removal grinding to the finest flat or contoured surface finishing.

WHEN Right now! Switch to this new cost-cutter today...get in touch with your CARBORUNDUM or distributor salesman—or write to Dept. P 82-67.

RUNDUM

MARK

for the NEW developments in ALL abrasive methods

Equipment and Supplies

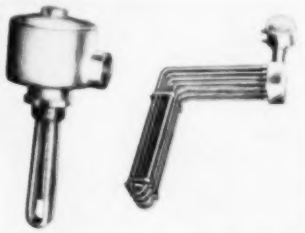
E—879. Parts and Chips Separator, Chip Grader—A new separator for more effective removal of parts from deburring and finishing chips and for grading chips is now being offered by The Gravi-Flo Corporation, 400 Norwood Ave., Sturgis, Mich. Three improvements are claimed: 1. greater compactness—½ floor space attained by locating the hopper at the top of the machine; machine area 3 x 6 ft. with pans, 3 x 8 ft.; 2. separation of parts without impingement; 3. grading of three sizes of chips at one time with the 2-deck carriage.

The inclined end of the screen carriage is motivated by an eccentric, while the lower end rests on ball bearing rollers. The machine is quickly converted to chip grading by the simple turn of a cam, which raises the lower end of the carriage off its rollers and creates a uniform throw over the entire length of the 2-deck screen carriage, permitting an accurate grading of chips. Screen sizes for various sizes of chips are available. For further information, use Reader Service Card.

E—880. Plastic Spray Booth Material—A vinyl-type paint-spray-booth coating material called Vincote, has been placed on the market by Detrex Corporation, Detroit 32, Mich. Specially developed for use on the side walls of both water-wash and dry paint spray booths. The material possesses rapid drying properties and when sprayed on a booth wall forms a plastic film said to be tough, of exceptionally high tensile strength, and impervious to paint, enamel, lacquer, and water.

The low adhesion of this material makes booth maintenance simple and rapid. When the paint over-spray has built up to a point where its removal is indicated, the coating and all over-sprayed paint is merely peeled off in large, easily removed sheets. For further information, use Reader Service Card.

E—881. Tank Heaters—The design of Chromalox type TBL electric tank heater manufactured by Edwin L. Wiegand Company, 7686 Thomas Blvd., Pittsburgh 8, Pa., now includes a vapor-tight terminal



box as a standard feature. Heavy duty Chromalox tubular elements are welded to the sealed electrical-connection housing and the wiring is brought out to the terminal box through a thick-walled steel pipe. The new construction is intended to give longer, safer usage of the units in the presence of corrosive and penetrating vapors. The chromalox TBL units are available in steel, alloy, or stainless with ratings from 3 to 7.5 kw. Heated height ranges from 11⅛ to 43¾ inches and length of feet from 13 7/16 to 25 9/16 inches.

The type ABMT screw-plug unit (bottom) with explosion-proof or vapor-tight terminal box is now available with wider build-in thermostatic range. With brass or copper construction for water heating the range is from 50 to 250° F.; with steel for oil heating it is 150 to 550° F. The safety features of this unit minimize the danger of heating near explosive fumes from lacquers, etc. The built-in thermostat simplifies installation and wiring. The ABMT unit is available with 2- and 2½-inch standard pipe-thread fittings in ratings from 1.5 to 10 kw. Heated length of unit ranges from 7¼ to 48 inches. For further information, use Reader Service Card.

E—882. Polyethylene Safety Jugs—Agilene safety jugs, fabricated throughout from polyethylene by the American Agile Corporation, P. O. Box 168, Bedford, Ohio, are of fully rigid construction and are extremely light in weight (one-third the weight of a comparable glass container and one-thirteenth the weight of a comparable lead container).

With polyethylene offering excellent resistance against most alkalies and acids, including hydrofluoric acid, they are primarily designed for the moving, and

Question!
How to Solve Your Thickness Problems?
Answer!
With the New KOCOUR Electronic Thickness Tester!
DETERMINES THE THICKNESS OF METALLIC COATINGS BETTER! . . . FASTER! . . . EASIER! . . . CHEAPER!
The new KOCOUR ELECTRONIC THICKNESS TESTER is the answer to your thickness problems . . . QUICKLY and almost AUTOMATICALLY — this highly accurate instrument can determine the thickness of all the commonly plated metals on various base metals . . . thus putting an end to costly rejects and reworking.
KOCOUR'S NEW ELECTRONIC THICKNESS TESTER HAS THESE OUTSTANDING FEATURES
Set is self-contained
90-95% accurate depending upon type and thickness of the plate
Average test requires only about 1 minute
Maximum thickness determined is 500,000 x of an inch (.5 mil) for chromium
Maximum thickness determined is indefinite
Operates virtually automatically
Reads directly — no calculations necessary
Relatively insensitive to surface roughness
Compactly housed in portable metal cabinet, 17x10x19"
Operates from 105-125 volt, 60 cycle, A.C. electric outlet
Write today for full information . . . no cost or obligation.
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Specify KOCOUR TEST SETS from Your Supplier! Pioneers and Specialists in Testing Equipment Since 1924
P.S. Whether your set-up calls for small or large volume work . . . there's a specialized KOCOUR SET for your requirements . . . developed to do a faster, better, more economical job.
SEE US AT THE IFE SHOW—BOOTH Q26

NOW IS THE TIME TO PUT HAVEG IN YOUR SYSTEM

- TANKS
- PIPES
- VALVES
- VATS
- TOWERS
- AGITATORS

● Recently production on many items of HAVEG was increased, with the delivery situation considerably improved. This may coincide with your need to get superior non-metallic corrosion-resistant equipment into your processing, rather than use a substitute that requires continued replacement and maintenance.

Start now. Contact your nearest Haveg sales engineer. Write for 64-page Bulletin F-6 showing chemical and physical properties of HAVEG, standard specifications based on over twenty years of installation and performance records. Inquire about improved deliveries on HAVEG . . . plan to fight corrosion all the way with HAVEG.

Visit the Haveg Exhibit at the Third Industrial Finishing Exposition in Chicago, June 16 through 20.

The work history of HAVEG in thousands of plants is of value to every engineer anxious to cut costs and resist corrosion: Here is a material that is economically molded into tanks, towers, valves, pipes, agers and agitators. HAVEG is not a lining or coating, and has uniform resistance to practically all acids, bases and salts, to chlorine and to many solvents and other chemicals excepting those of a highly oxidizing nature. It can be repaired and altered on the job.

HAVEG CORPORATION

NEWARK 1, DELAWARE

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CLEVELAND 14	CHICAGO 11	DETROIT 35	CHATTANOOGA 2
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HARTFORD 5	HOUSTON 4	LOS ANGELES 14	SEATTLE 7
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FOR YOUR PRODUCT...

McGean

BRIGHT NICKEL

Plating Process is Outstanding

BECAUSE IT

IS ECONOMICAL TO OPERATE

IS EASY TO CONTROL

PRODUCES HIGHLY LUSTROUS DEPOSITS, DAY AFTER DAY

THE McGEAN CHEMICAL COMPANY • CLEVELAND 15, OHIO

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DETREX PROVIDES BOTH

METAL CLEANING EQUIPMENT

METAL CLEANING COMPOUNDS

...TO GIVE YOU "ONE SOURCE" EFFICIENCY

Only Detrex has the facilities to handle your entire metal cleaning process. This one-source service offers many advantages for you—complete responsibility is in the hands of one competent company . . . increased efficiency and worthwhile savings are made through coordinated planning of the process . . . the results of the *complete* process are guaranteed by Detrex. As an added benefit, Detrex service personnel are always available to keep your metal cleaning operations at peak efficiency.

Whether your operation calls for an alkali cleaner, an emulsion or a degreasing solvent, Detrex can fill the bill. If you plan to be at the American Electroplaters Exhibition in Chicago drop into our booth for the whole story of Detrex service and how it can save for your company. If you're not planning to attend call the local Detrex field office or write direct to **DETREX CORPORATION, Box 501, Detroit 32, Mich.**

● WE'LL BE LOOKING FOR YOU AT BOOTH S-1, CHICAGO, JUNE 16—JUNE 19

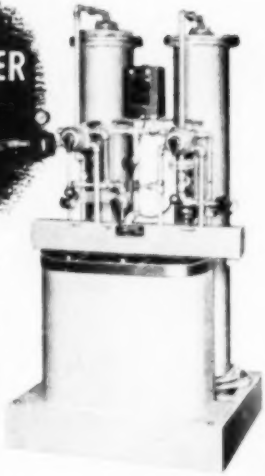
DETREX CORPORATION

DEGREASERS • DEGREASING SOLVENTS • WASHERS
ALKALI & EMULSION CLEANERS • DRYCLEANING EQUIPMENT
PHOSPHATE COATING PROCESSES

CHEMICALLY PURE WATER
is Cheap

only a few cents a thousand gallons

with **INDUSTRIAL**
Water Demineralizers



A two-bed INDUSTRIAL demineralizer unit. Standard units are available with capacities of 200 to 1000 gph. Special units of any capacity are engineered to requirements.

Eliminate UNWANTED PRECIPITATES
HOT WATER RINSE STAINS

These two difficulties in plating can be eliminated with one stroke—chemically pure water. Pure water in plating solutions improves the over-all quality of plated coatings. The use of pure water for hot rinses prevents stains and water marks after drying. With an INDUSTRIAL demineralizer chemically pure water costs so little that the unit pays for itself in a short time. It's easy to install and operate, and requires very little floor space.

Write for Bulletin 200

or send us a water analysis, letting us know the amount of treated water required in gallons per hour, and whether intermittent or continuous flow is needed. We will then give you the whole demineralizer story, including estimated cost, equipment required, performance data, etc. for your requirements.

for solution clarification . . .

INDUSTRIAL Filters

A typical INDUSTRIAL stationary filter. Standard portable and stationary models are available with capacities 100 to 15,000 gph. Special filtering systems are engineered to meet unusual requirements.

Write for Full Information and Recommendations

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

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Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

Equipment and Supplies

handling of smaller quantities of corrosive chemicals in various industrial operations. They may be dropped or suffer rough usage without cracking or breaking, and splashing or spilling are prevented inasmuch as liquid can escape only through the spout. The jugs are available in standard sizes of $1\frac{1}{2}$ and $3\frac{1}{2}$ gal and weigh $4\frac{1}{2}$ and $5\frac{1}{4}$ lb respectively. For further information, use Reader Service Card.

E 883. Radiant Heating Oven—A completely integrated radiant-heating oven for industrial baking and drying at temperatures of 650° F or less has been developed by Jensen Specialties, Inc., of

Detroit, Mich. Utilizing 2000-watt GE Calrod heaters, it is said to be the first of its type to be manufactured in a complete panel, including tubular heating elements, reflectors, and insulation, with plug-in receptacle and pantograph mounting features. Thus the company can build units of any length, size, or rating and change ratings of finished ovens at will.

According to Jensen engineers, the new oven can handle three times more work than earlier radiant heating models—the payload heating result often being 18,000 deg lb kwh. For further information, use Reader Service Card.

E 884. Protective Creams—A new line of antiseptic protective creams has been introduced by the West Disinfecting Company, 42-16 West St., Long Island City 1, N. Y. Containing hexachlorophene, they are said to provide a "zone of inhibitation" against Staphylococcus aureus and are so formulated as to be almost neutral, thus assuring against irritations from free acids or alkalis. Three grades for protection against different substances are available. For further information, use Reader Service Card.

E 885. Phosphating Compound—Metal Industries Department, The Diversey Corporation, 1820 Roscoe St., Chi-

"CONDUCTA-CORE" LEAD ANODES

. . . Gaining Wide Acceptance in the Plating Industry!

Federated Conducta-Core Lead Anodes . . . designed for decorative or hard chromium plating . . . are high quality products made of prime lead, alloyed under strict metallurgical control.

The highly conductive and non-contaminating 3/8" diameter aluminum rod which runs the full length of the uniquely designed anode assures complete rigidity . . . there is no warping or buckling to interfere with automatic plating operations.

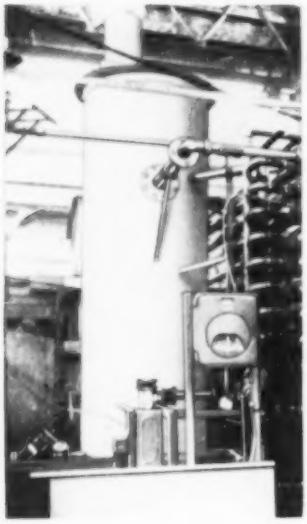
The Conducta-Core Anode's great number of high projections gives greater-than-average throwing power. Its large surface area tends to offset gas polarization . . . anode temperature is kept uniform.

No worry about anodes dropping into the tank because of corroded hooks . . . an improved lead coating 3/16" thick at the base of the copper hook insures permanently attached anodes!

Federated Conducta-Core Anodes are made in standard lengths up to 52 inches, with a variety of hooks. Special sizes are available. Flat Rolled and a variety of extruded cross sections can also be supplied.

Federated Metals Division

AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.



Chromic Acid Concentrator

The unit illustrated above is a chromic acid concentrator in use in a large Ohio plating plant. The system of which this unit is the heart is currently recovering 55% of chromic acid formerly lost thru dragout. The plant estimates a $1,650 monthly savings on ferrous sulphate used for treatment, and a $2,500 monthly savings in reduced chromic acid consumption. These figures, however, would vary from operation to operation. In addition to the above advantages, the problem of waste disposal is considerably reduced.

Designed and built by Maurice A. Knight, the unit, the first of its type, has a Sealon lining which has excellent resistance to the corrosive action of plating solutions. Concentrators of this type are also being used for concentrating solutions of nickel plating salts, and may be used for concentrating other plating solutions.

Write for further information regarding the use of a Knight concentrator in your operation.

MAURICE A. KNIGHT
Kelly Ave., Akron 9, Ohio
Acid and Alkali-proof Chemical Equipment

Equipment and Supplies

cago 13, Ill., announces Divoband for phosphatizing iron and steel prior to painting. It forms a thin but extremely tough skin on iron and steel which retards rusting of the clean metal prior to painting, promotes better paint adhesion and prevents flaking and peeling. For further information, use Reader Service Card.

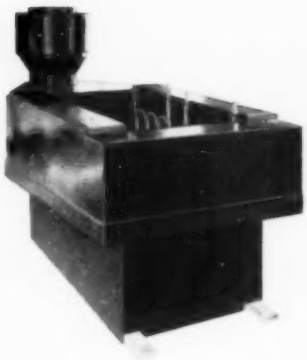
E. 3386. Hub Contact Wheel—A product which offers the possibility of halving contact-wheel cost and improving versatility was announced recently by The Carborundum Company, Niagara Falls, N. Y.

The Universal Hub contact wheel consists of a bolted assembly which includes a flanged Universal Hub, a T-61 serrated rubber tire and a side plate. The tire, when worn out, is discarded and replaced by a new tire at half the cost of a standard contact wheel.

The hub-and-plate unit will mount a variety of rubber tires of from ¼ to 6 inches in width and from 5 to 105 durometer in hardness. This feature permits everything from rough belt grinding down to the finest finishes on flat surfaces or contoured parts without removing the hub from the spindle. Tires can be changed in only a slightly longer time than that required to change a solid-hub contact wheel. Each part—hub wheel, plate and tire—is separately balanced. For further information, use Reader Service Card.

E. 3387. Wet Blast Chemicals—A complete line of abrasives for wet-blasting machines is available directly from stock, according to an announcement made by American Wheelabrator & Equipment Corporation, 1130 S. Byrkit St., Mishawaka, Ind. Sizes range from 80 to 2500 mesh, and they are packaged in convenient 50-lb weights for easy charging and storage. They are shipped in sturdy corrugated cartons which withstand rough handling.

American Wheelabrator is also prepared to provide from stock all other chemicals needed for wet blasting. Amerust, the company's rust inhibitor, embodies two characteristics new to inhibi-



Tanks and Linings For

- *Plating*
- *Anodizing*
- *Acid Pickling*
- *Neutralizing*

Knight plating tanks are lined with Sealon, a vinyl plastic with excellent resistance to the corrosive attack of plating solutions.

Advantages of Sealon:

Resists oxidation, water, sunlight
Easily tested electrically
Readily repaired
Less down time
High electrical resistivity
Resists abrasion
Comparatively thin and light weight

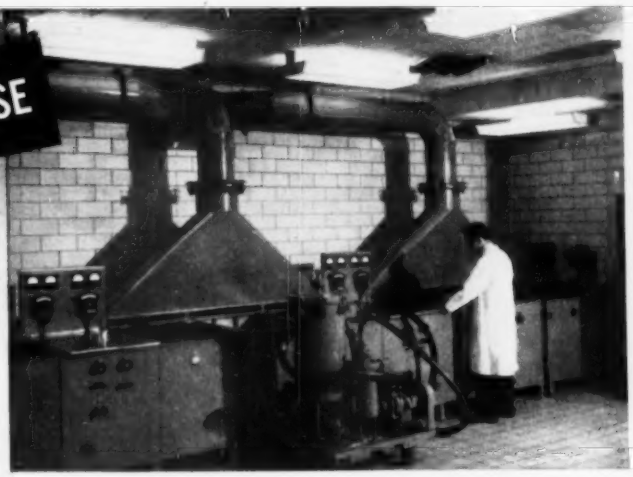
Temperature Limitations

Not recommended for temperatures above 150 F. For operation at higher temperatures acid proof brick linings can be installed over Sealon lining. Brick linings should also be used where tank must withstand severe physical abuse.

Lined tanks can be furnished F.O.B. Akron, Ohio, or linings can be installed on the job by experienced field crews.

MAURICE A. KNIGHT
Kelly Ave., Akron 9, Ohio
Acid and Alkali-proof Chemical Equipment

WESTINGHOUSE

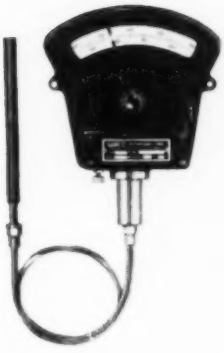


Our illustration shows a corner of the extensive pilot plating plant at Westinghouse's East Pittsburgh laboratories, where many improved plating processes have been developed and tested.

For example, this line of 100 gallon tanks was used to perfect the company's P.R.* process of plating to secure brighter finishes by periodic reversal of the plating current.

Five Sarco Type LSI indicating electric controls actuating solenoid valves to maintain any desired constant plating temperature on 100 gallon tanks of PR process pilot line at East Pittsburgh.

SARCO PLATING CONTROLS



Sarco Plating Controls were selected as a result of several years' experience in Westinghouse plants in Pittsburgh and elsewhere.

You can buy them with confidence. Low first cost, high accuracy, long life with minimum maintenance cost are outstanding features. Write for our Bulletins and the name of the Sarco man nearest you. His experience may include the solution to some of your control problems.

Sarco Type LSI indicating electric temperature control for all kinds of plating. Long or short temperature ranges custom made as needed. Bulletin 1026.

*For full information on this process see the article in the May 1st, 1950, issue of "Steel".

New Sarcostat hydro-electric motor valve for use with LSI thermostats in place of solenoid valves. Powerful, direct thrust—no pilots or levers, slow opening and closing. Bulletin 1001.

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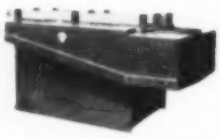

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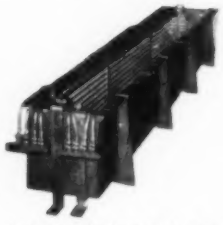

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Equipment and Supplies

tors. Being in liquid form it goes into solution immediately, and it virtually eliminates the staining normally expected with inhibited water. Anaset, an anti-packing chemical, completes the company's line of wet-blasting supplies. For further information, use Reader Service Card.

E 3888. A-C Clamp-Type Volt-Ammeter—Columbia Electric Manufacturing Company, Dept. P, 4553 Hamilton Ave., Cleveland 14, Ohio, offers a Type AC-1 Volt-Ammeter to supplement its line of Long-Test Ammeters.

Readings are made without breaking circuit or insulation. To read amperes the trigger is pressed, opening the pair of insulated jaws so that they can encircle cables up to 1½ inches in diameter and bus bars up to 2 x ½ inch. Four ampere ranges are available: 0-12, 0-60, 0-120, 0-600 a-c. Voltage leads are plugged into the handle of the instrument. Two voltage ranges are available, 0-150 and 0-600 a-c. An accuracy of ±3 per cent of full scale deflection is claimed. For further information, use Reader Service Card.

E 3889. Near Infrared Heating—Many baking, degreasing, curing, preheating, and similar jobs are said to have been speeded up by the use of the far-infrared radiant heaters, which radiate its energy in the almost invisible "far-infrared" portion of the spectrum. The older and more familiar infrared bulbs produced their energy in the "near infrared" wave length, which is "near" to the visible

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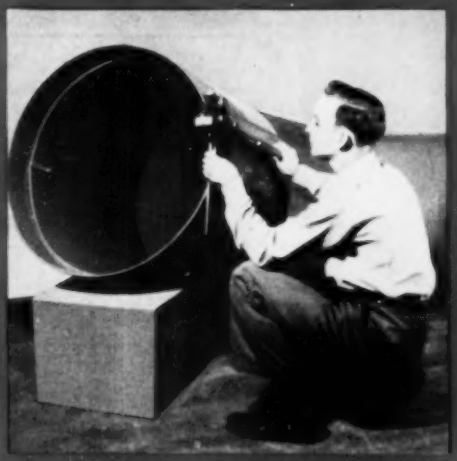

12" Elbow fabricated of Boltaron 6200—This is part of a fume system installation designed for the RCA plant at Lancaster, Pa.

Plenum chamber fabricated of Boltaron 6200—To exhaust a combination of acid fumes.

Specify RIGID, NON-PLASTICIZED *Boltaron* 6200 POLYVINYL-CHLORIDE

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CHEMICAL RESISTANCE, LIGHTNESS, STRUCTURAL STRENGTH

Extruded solid bar stock available in standard 10 ft. lengths, $\frac{3}{8}$" to $1\frac{1}{4}$" in diameter. Pipe in standard iron pipe sizes $\frac{1}{2}$" to 4" i.d. —ten- and twenty-foot lengths . . . can be threaded like mild steel, using ordinary pipe dies.

Fittings and valves available. Complete catalog is in process of compilation, will be available soon.

Sheet stock available for authorized fabricators to make up into special shapes and units as illustrated in photographs above . . . two typical examples of the adaptability and strength of Boltaron 6200.

Welds easier than steel . . . easily fused with low temperature hot air torch.

AVAILABILITY — Distribution is limited to selected fabricators trained by the Hartwell Company. This ensures that your fabricator will make efficient and economical use of Boltaron 6200. Trained fabricators have already been licensed and established on West Coast, East Coast and in Central States area. All inquiries are processed by the Hartwell Company to ensure that the right fabricator is assigned to a given job. For further details, write to our home office, address below.

PARTIAL LIST OF APPLICATIONS

- Hoods
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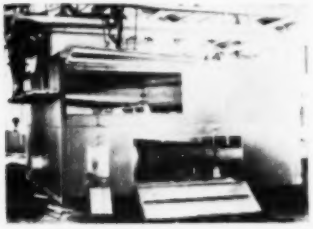
Equipment and Supplies

portion of the spectrum. Near-infrared is almost wholly reflected by white materials. The "far-infrared" rays, being of longer wave length, are absorbed almost equally by all colors and materials, from white to black.

New uses include fusing vinyl films and degreasing. Many installations are conveyorized. For more information about Chromalox electric radiant heaters write Edwin L. Wiegand Company, 7686 Thomas Blvd., Pittsburgh 8, Pa., or use Reader Service Card.

E—890. Dust Collectors—The Green Fuel Economizer Company, Inc., of Beacon, N. Y., has added the Aerodyne Dust Collectors to its line of products by acquiring U. S. patent rights from the Aerodyne Atlantic Corporation of New York, N. Y.



Developed in Sweden before the war, the collectors were introduced in the United States in 1949. They are said to combine high collection efficiency with economical operation and little maintenance. Their low draft loss of approximately 1 inch wg is of special interest to power plants required to eliminate fly ash and soot from their stack gases. Flexible in design and of heavy-gauge sturdy construction but with light, easily handled filtering elements, they can be installed in very limited spaces and at low cost, it is said.

Complete laboratory facilities are available at The Green Fuel Economizer Company, Inc., in Beacon, N. Y., for the analysis of dust particles and the running of collection efficiency tests on all types of dusts under field operating conditions. Cooperating companies are the Aerodyne Development Corporation, of Cleveland, Ohio and the Aerodyne Detroit Company, Inc., of Detroit, Mich. For further information, use Reader Service Card.

E—891. Stripper for Synthetics—Star Stripper N is a new development by Silver Star Chemical Corporation, 58 Watts St., New York 13, N. Y., for the cold stripping of various types of synthetic coatings from aluminum and its alloys that are normally difficult to strip by the usual

Cadux H S Process sure gives a brighter cadmium finish...

That's because its wide impurity tolerance allows easier control, gives better covering power, results in *exceptionally* bright deposit. And what's more important—with agitation, you can increase current densities up to 70 amp./sq. ft., which makes H-VW-M's Cadux HS (high speed) Process—in barrels or on racks—*faster, brighter, better!* And that's not all . . .

This *exclusive* Cadux HS (high speed) bright cadmium process is the result of over eighty years of constant electroplating development—a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer—not only in a bright cadmium finish—*but in every phase of plating and polishing.*

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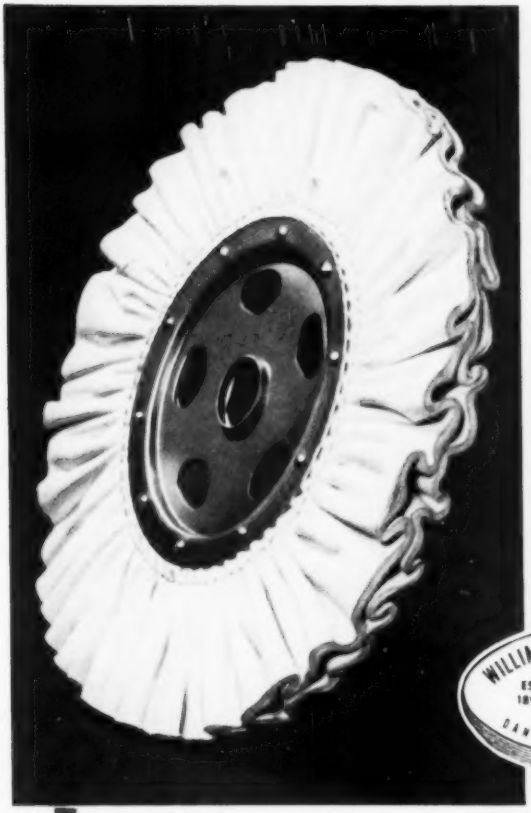

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Equipment and Supplies

cold- or hot-type strippers. The most tenacious coatings are said to be easily removed without attack to the basis aluminum metals. For further information, use Reader Service Card.

E-892. Bench Model Hard Chromium Plating Unit The Cro-Plate Company, Inc., Hartford, Conn., announces Cro-Plater "100", a self-contained

precision hard-chromium plating unit said to be capable of meeting all electroplating requirements.

The bench model plater requires a space of only 2 x 3 feet, yet all controls, transformers, rectifiers, switches and heating elements, including the plating tank, are contained within the unit. Current and duct outlet are the only connections required.

The tank is lead-lined Armco iron, and this lining can be changed for the plating of other metals. Tank heating is by easily removed 1500-watt electric heaters. Bath temperature is thermostatically controlled. All circuits are overload-protected. Rectified d-c power is up to 100 amp at 0 to 12 volts. For further information, use Reader Service Card.

E-893. Corrosion Protective Coatings The exteriors and interiors of acid and plating solutions tanks can now be protected against corrosion by Lankote 200-series plastic coatings sold by The Lankote Division, J. Landau Company, 221 Wooster St., New York 12, N. Y. They can be brushed or sprayed, and are said to be highly resistant to acid alkali, salt and hot-water solutions. For further information, use Reader Service Card.

E-894. Bright Aluminum Paint—Greater two-tone flash and glamour for polychrome or metallic finishes are said to be possible through the use of a new aluminum paste made by Aluminum Company of America, 801 Gulf Building, Pittsburgh 19, Pa. Designated as Aluminum Tinting Paste No. 222, it does not interfere with true color values, and gives a "clean" appearance of great depth to the finish. This pigment, while achieving the utmost in iridescence, is characterized by an absence of seeding.

While primarily intended for automotive finishes, the paste also imparts a striking, beautiful effect to the hammertone finish on household equipment and appliances, it is said. Very pleasing effects can be obtained when used in non-smudge solid aluminum colors. For further information, use Reader Service Card.

E-895. Exchange of Rebuilt Paint Spray Equipment Inauguration of a new service plan is being announced by the DeVilbiss Company.

Every Authorized DeVilbiss Sales Outlet and factory branch in the United States will offer this Rebuilt Exchange Program, and rapid service will be backed up by six factory rebuilding centers which the company has established at Chicago, Ill.; Santa Clara, Calif.; Dallas, Texas; Atlanta, Ga.; Newark, N. J., and at the main plant in Toledo, Ohio. The exchange units are said to be completely rebuilt by factory trained technicians and incorporate all design improvements that affect life or performance. They carry the same guarantee as new units.

In inaugurating the new program, DeVilbiss will limit exchanges to its most widely used spray guns, types P-MBC

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Production Plating of Small Parts

FIRST IN PRODUCTION OF

White Brass *as substitute for* Nickel

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Only Solventol can give you fifteen years of practical experience in di-phase metal cleaning application. Introduced by Solventol it is a basically new approach to the mass production metal cleaning problem.

Today it has replaced older methods because of its high efficiency, low cost and many other advantages.

Call your Solventol engineer now for the latest technical information and best guidance in solving production cleaning problems.

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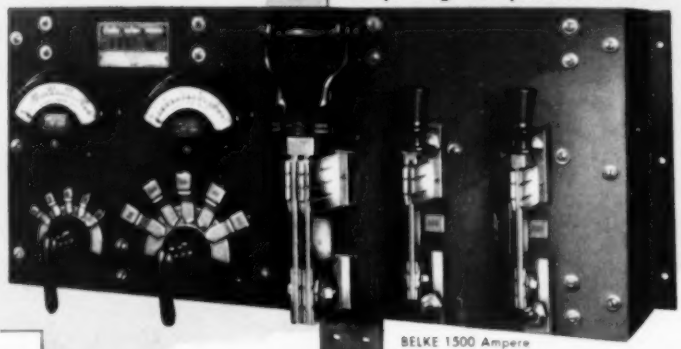
DESIGNERS AND BUILDERS OF SPECIALIZED METAL CLEANING EQUIPMENT

Single Ampere Current Control from 1 to 10,000 amperes

Also ¼ and ½ ampere regulation for plating with precious metals.

Improved BELKE Commutating Rheostat

selects any amperage with a twist of the wrist



BELKE 1500 Ampere Commutating Rheostat with 5 ampere steps

How to operate a BELKE Commutating Rheostat

Fig. 1

One-ampere step controls for 100-ampere BELKE Commutating Rheostat. Amperage controlled is plainly marked on each contact. A twist of the wrist selects contacts required to give the desired amperage.

Fig. 2

To select 1 to 4 amperes and 10 to 40 amperes, turn the control arms clockwise to engage the required contacts. For example, the diagram shows commutating control blades set for 14 amperes, 4 amperes on the left control, 10 amperes on the right.

Fig. 3

To select 5 to 9 amperes and 50 to 90 amperes, turn the control arms counterclockwise. For example, the diagram shows the commutating blades set for 67 amperes, 7 amperes on the left control, 60 amperes on the right.

For greater amperages, another commutating control and/or knife switches are added. For large capacity rheostats where 5-ampere steps are satisfactory, the left control can be furnished with 5, 5, 5, 5 and 25 ampere contacts and the right control with 50, 100, 100, 100 and 100 ampere contacts, etc.

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Only high grade knife switches are used. Positive tension with wiping action of the circular blade assures positive contact. Arcing is avoided due to the small amount of current added by each contact engaged by the blade.

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Vertically mounted Coils with positive spacing for compactness, dependability, self-cooling and self-cleaning.

Air-circulating Case Design—draws like a chimney to pull air through the coils for continuous cooling.

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LEA Copper Glo gives you brilliance with exceptional speed of deposition and excellent throwing power. Its high speed plating characteristics (Hull cell bright current density range 10-60 amperes/sq. ft. for standard formulations) permits production increases of from 30% to 60%, using existing equipment.

Plating minutes are valuable to you. Check up on Lea Copper Glo by the Ronal Process. In addition to brightness and high current density operation, it offers such added operating advantages as greater throwing power, ductile deposits, elimination of wetting agents and low copper concentrations.

* *The Ronal Bright Copper Process is a development of Ronal Chemicals Inc., Brooklyn, N. Y., for which process patents are pending.*

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Equipment and Supplies

and MBC-510, and its complete line of air compressors. The owners of finishing units will no longer be compelled to suspend operations until repairs are completed. For further information, use Reader Service Card.

E-896. Small Parts Automatic Phosphatizing and Painting Machine—The Cincinnati Cleaning and Finishing Machinery Company, Schmidt Bldg., Cincinnati, Ohio, offers equipment that washes, phosphatizes, rinses, and dries small parts, then dip paints, drains and bakes them, returning them to the loading station for unloading by the operator.

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In operation, the parts are placed on racks which are attached to the machine's monorail conveyor. As they pass through the paint tank, the rack is tilted slightly to eliminate air bubbles on the inside of the parts. The paint drying oven is a glassless infra-red unit which is mounted on top of the washing machine. To allow for variations in drying time occasioned by changes in temperature or humidity, each oven is wired in four banks. For further information, use Reader Service Card.

E-897. Flow and Liquid Level—A new receiver for measurement and control of flow and liquid level has been developed by Minneapolis-Honeywell Regulator Company, Brown Instruments Division, Wayne and Windrim Aves., Philadelphia 44, Pa. An Electronik inductance bridge receiver, it combines in a single instrument a number of functions which formerly required the use of two instruments. For example, the new instrument makes it possible to indicate, record, integrate and control flow and liquid level. Data can also be retransmitted pneumatically to a second receiver remotely located. For further information, use Reader Service Card.

E-898. Small Parts Cleaning Machine—Zenith Manufacturing & Chemical Corporation, 52 Beckman St., New York 38, N. Y., manufacturers of a line of widely used watch cleaning machines, announces a new type of cleaning machine called "Instro-Met". Designed specifically for cleaning instruments with small

or large delicate parts, the final model is said to have been tested for months under actual working conditions. Features include (1) three windows on motor support for checking while machine is in operation; (2) spun-aluminum 1-gal tanks and covers instead of hazardous glass; (3) heavy cast-aluminum basket with three monel-mesh removable compartments for simultaneous cleaning of a variety of different parts; (4) snap-on operation of basket to impeller shaft and splined inner steel tube of center supporting column for automatic centering over tanks and dryer. For further information, use Reader Service Card.

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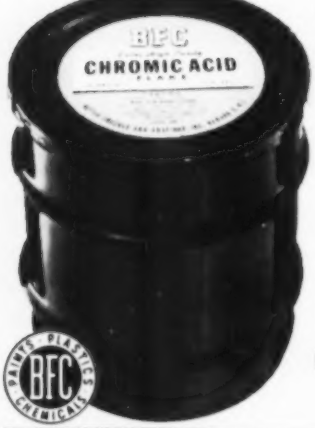

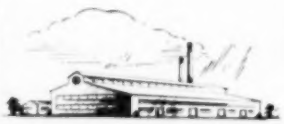

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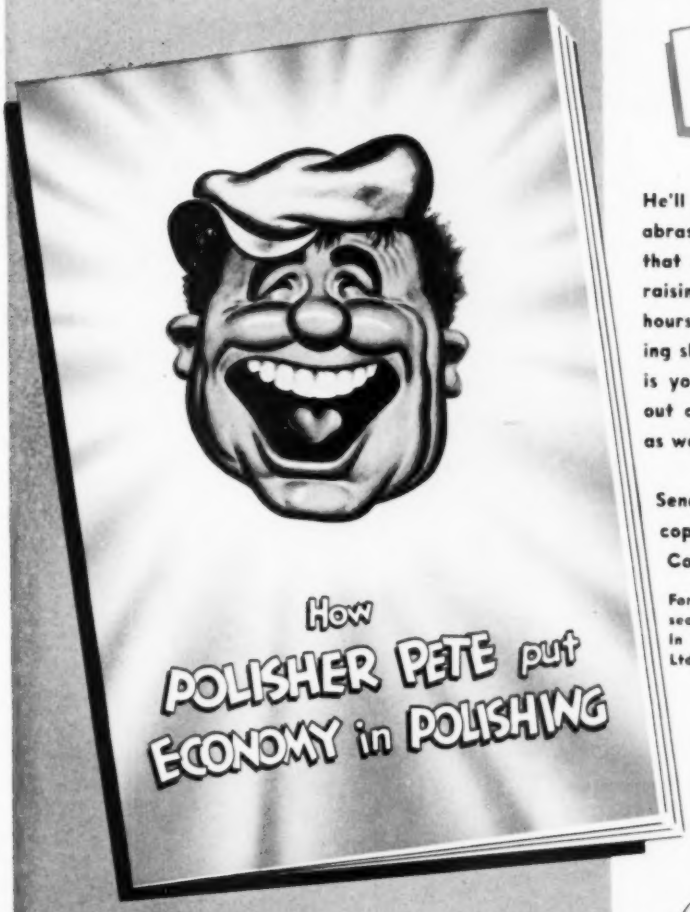

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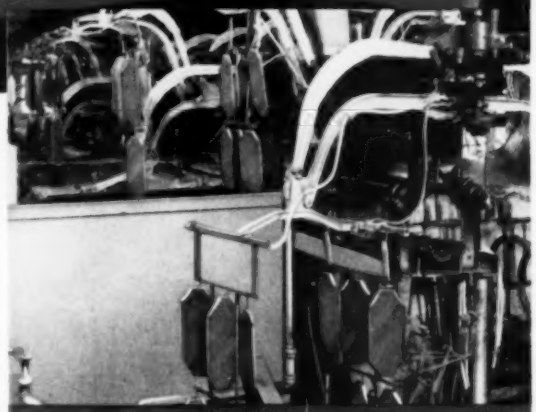
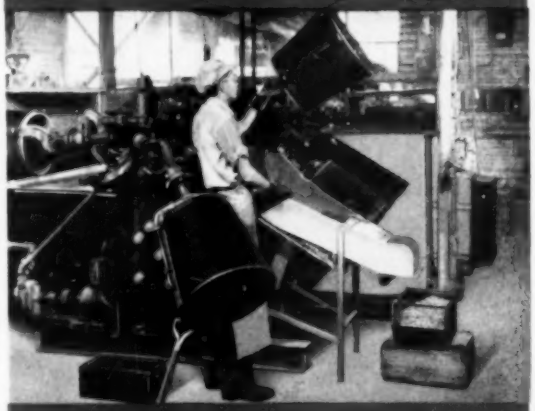


About 6000 larger parts are zinc-plated daily on this Stevens Automatic Plating Machine with 19 different parts being processed. Just one man operates this zinc-plating machine.



More than 400,000 parts are run through this Stevens Automatic Barrel Plating Machine daily with 328 different parts being plated. This machine also requires but one operator.

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JUNE, 1952 VOL. 39, NO. 6

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Editorial

WHY EXPOSITIONS?

WE HAVE Industrial Finishing Expositions because we think of them as powerful means for the dissemination of the most practical kind of information and because they are wonderful publicity for both the metal finishing industry as a whole and for the American Electroplaters' Society.

It was with these thoughts in mind that a small Detroit Branch group, including George Nankervis, the late Carl E. Heussner, Herberth Head, and Edward Berry, conceived and carried through to a spectacularly successful conclusion the first of our large scale expositions, held in 1947 in Detroit.

It is characteristic of the Society and of the industry that, despite the worrisome strugglings with the many problems such a large effort is sure to entail, these men contributed their services without thought of personal gain. The Detroit show was planned to make money and did; income in excess of expense passed to the Society's national treasury, there to be held until used to further the basic interests of the Society and of the industry.

The Newark Branch exposition committee headed by George Wagner and the late Horace Smith gave us a second show in 1948 in Atlantic City. Now, after a planned lapse of four years, but with unchanged purpose, the Chicago Exposition Committee, headed by Clyde Kelly and Herberth Head, with the aid of others, has completed arrangements for our third and largest Industrial Finishing Exposition.

We are proud and happy to present this show as a part of our 39th Annual Convention program, scheduled for the four convention days starting June 16, in Chicago. For you, in Chicago's International Amphitheatre, more than 125 companies will display everything in our field that is up to the minute in products, apparatus, equipment and services. More than 125 brand-new items will be shown. For you, at a total cost estimated to be about $500,000, close to 1,000 specialists will stand by to demonstrate and to discuss exhibits valued in excess of $3,000,000. We deeply appreciate the cooperation accorded us by the many companies participating to the end that this exposition will be the most complete yet assembled for the plater and for those interested in the allied arts. Your presence is all that is needed to insure success.

If the exposition idea is to endure, benefits must be mutual. The exhibitor, too, is entitled to gain. See his presentation and hear his story. That is all he asks; thriving in the air of free competition that makes our country great, he is willing to be judged on merit—and, perhaps unexpectedly, you may hit upon the answer to that problem that has been troubling you.

Cleve Nixon

Clear Protective Coatings for Copper-Chromium Plate

WAYNE R. FULLER

Director of Research, Grand Rapids Varnish Corporation, Grand Rapids, Mich.

OF THE PROBLEMS created by our program of military preparedness the one posed by the prohibition of the use of nickel for most civilian purposes was only a minor dislocation in terms of the National economy. To the electroplater, however, it was a major catastrophe. It meant that a chromium finish could no longer be produced by plating, consecutively, copper, nickel and chromium. And the electroplater knew that when chromium is plated directly on copper the resulting finish is sadly deficient in protective ability. The automobile manufacturer also knew this and was gravely concerned about the plating on the zinc-base diecastings used so lavishly for the ornamentation of automobiles.

Among all of the types of plate, only nickel-chromium or copper-nickel-chromium combine to a satisfactory degree adequate protection and the appearance that the public prefers. The only apparent method of preserving the appearance of the chromium plate and at least partially compensating for the protection lost by the elimination of nickel undercoating was to apply a clear organic coating.

Up to that time organic coatings for use on chromium plate had been mainly enamel products, and their purpose had been decoration of such small parts as emblems, radiator ornaments and door handles. Service requirements had not been severe. The main problem had been to secure adhesion to the very smooth, chemically almost inert surface, and this had been solved satisfactorily by minor modification of conventional baking-enamel formulas based on alkyd-resin amine formaldehyde-resin vehicles.

Requirements

A clear coating for protection was an entirely different matter. The electroplater specified that this coating must: (1) bake at a temperature not exceeding 300° F (149° C), preferably 275° F (135° C), to avoid blistering of the plate on zinc-base diecastings, (2) have excellent adhesion, (3) have abrasion resistance of a high order, (4) show no discoloration or dulling of the bright finish, (5) impart good salt-fog resistance to copper-chromium plate, and (6) have satisfactory weathering properties. Also mentioned were resistance to water immersion, humidity, grease, and perspiration. Inasmuch as this sounded like a rather large order, coating manufacturers were quick to realize that it called for evaluation of all of the resins and resin combinations that might conceivably prove advantageous, with emphasis on the newer developments that had not been thoroughly tested in chromium coatings.

Development Work

The resins tested are of three general types, as follows:

A. Thermoplastic
   1. Nitrocellulose
   2. Vinyl copolymer
   3. Methacrylate
B. Oxygen convertible
   1. Phthalic alkyds
   2. Fatty acid ester of Epon (epichlorhydrin bis phenol)
C. Heat convertible
   1. Amino-formaldehyde

Phenol-formaldehyde resins were ruled out by their tendency to discolor.

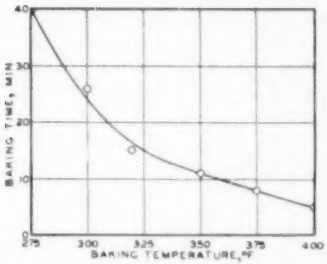
In most cases each sub-group was represented by more than one specific resin, amino-formaldehyde resins by six. With one exception, each formula contained two or more resins. A majority of the formulas contained only two resins, which differed in type. Thirty separate formulas were included in one series of preliminary, or screening, tests by one coating manufacturer.

In this series of screening tests, the coatings were applied on copper-chromium plated test panels supplied by the Doehler-Jarvis Corporation and cleaned by it. The coatings were sprayed to a dry-film thickness of approximately 1 mil (25 μ), and baked 20 minutes in a convection oven at an air temperature of 300° F (149° C). The films were tested only for hardness, toughness, and adhesion, with a view to elimination of all materials that were deficient in these properties. Only three materials showed promise: (1) a combination of alkyd and amino resin, (2) a combination of Epon ester and amino resin, (3) a combination of methacrylate resin and nitrocellulose. The latter was dropped from further consideration because of its low solids content at spraying consistency and the extremely thin dry film produced. Thus, two types of formulas remained for more complete evaluation.

In the above-mentioned screening tests the baking had been done on a single schedule, which had been chosen somewhat arbitrarily. At this point it was decided to determine the optimum baking schedule before conducting further evaluation of the materials. The alkyd-amino resin formula that had given best results was chosen for this purpose. It was necessary to establish some method and standard for determination of satisfactory conversion, or cure. By correlating salt-fog results with measurements of film hardness, it was found that a hardness of H by the pencil method was adequate for excellent performance. (H hardness means that the coating cannot be scratched with an H pencil but can be scratched with a 2H pencil.) The coating was sprayed on heavy test panels to a dry-film thickness of approximately 1 mil (25 μ) and baked in an electric convection oven at six different air temperatures ranging from 275 to 400° F (135 to 204° C) until a hardness of H was obtained. The resulting optimum baking schedules are found in Fig. 1. Inasmuch as a baking time of 40 minutes is excessive, and temperatures above 300° F (149° C) are likely to cause some blistering of plate on zinc-base alloy, it was decided to adopt a schedule of 30 minutes at 300° F (149° C) for the remainder of the testing program.

The two formulas that had survived the screening tests were then subjected to the following tests:

1. Water immersion at 100° F (38° C) for a minimum of 168 hours, with the films being scored to the plate
2. Salt fog at 95° F (35° C), using a 5 per cent solution, for a minimum of 168 hours. The films were again scored to the plate
3. Weather-O-Meter test for 250 hours
4. Exposure to intense ultra-violet light for 24 hours
5. Exposure to 50 per cent acetic acid for 4 hours, to obtain an indication of resistance to perspiration
6. Impact test for adhesion
7. Abrasion resistance by the Tabor Abraser, using CS 10 wheels and 1000-g load



Optimum baking schedules

In the foregoing tests the alkyd-amino resin formula proved definitely superior to the Epon ester-amino resin formula in color retention under ultra-violet light, resistance to abrasion, and resistance to salt fog, and equal in all other properties. It met the most severe specifications of automobile manufacturers. Against a salt-fog requirement of 168 hours, it showed no creepage from the score line or other failure after 250 hours. In a later test it was subjected to five cycles of the following:

(a) 8 hours at 175° F (79° C)
(b) 8 hours at −40° F (−40° C)
(c) 8 hours in Weather-O-Meter

After the five cycles, the finish was subjected to salt fog for 250 hours, and there was no failure.

This description of how coating manufacturers solve a problem may have created the impression that the final answer is simply to mix an alkyd resin and an amino resin. Any such impression needs be corrected. Alkyd resins come in a very wide range of compositions and properties, and it is important to use the particular alkyd resin or mixture of alkyds that is best for a clear coating over chromium. In like manner, the amino resin requires careful selection for best performance in the particular formula. Finally, the proportion of alkyd resin to amino resin must be closely adjusted to give optimum results.

Performance Factors

It is safe to say that no electroplater has been able to obtain consistently the best performance that is inherent in the coatings and reflected by the laboratory-test results that have been described. The use of these coatings certainly raises many problems, and the results are governed in large measure by the attention and understanding which are applied to these problems.

Treatment of the Chromium

The first factor that calls for consideration is the cleaning and conditioning of the parts before the clear coating is applied. Occasionally chromium plate requires buffing, and buffing compounds may contain wax. A recent analysis of three kinds of buffing sticks that were represented as wax-free disclosed that all

three contained wax. An alkali wash at 185° F (85° C) is reported to be effective. The temperature is important; it should be higher than the melting point of the wax. Following the alkali wash and a cold-water rinse to remove excess alkali, the prevailing practice is to rinse with very dilute chromic acid and finally with deionized water. The clear coating should be applied as soon as feasible after the prepaint treatment, preferably on the same day, as contamination from the air may reduce the adhesion and affect other properties.

Coating Thickness

Next in order is the application of the coating. The main point here is that it should be applied uniformly and in adequate film thickness. As a rule dipping is eliminated by the shape of the parts, leaving spraying as the only feasible method of application. The difficulty of properly controlling the film thickness is aggravated by the variable shapes of the parts and by the transparent nature of the coating, which makes it difficult for a hand-spray operator to judge the thickness being applied. Parts from production lines have shown a dry film thickness as low as 0.2 mil (5 μ) and as high as 3 mils (76 μ). The only means for proper control seems to be automatic spraying. Uniformity of film thickness over the entire surface of the individual parts can be improved further by electrostatic spraying with suitable equipment. Another advantage of electrostatic spraying is that it offers possibilities of reducing the loss by overspray, which at best is large, by 50 per cent or more. Both the automatic sprayer and the electrostatic equipment must be carefully chosen and engineered to fit the job. One automobile manufacturer specifies a dry film thickness of 1 ± 0.1 mil (25 ± 2.5 μ). This is a fine goal, but the electroplater will be doing well if he maintains a range of 0.7 to 1.2 mil (18μ to 30μ), which will insure good performance. There is little chance of controlling the film thickness without frequent determinations, and this calls for both a wet-film thickness gage and a dry-film thickness gage. These instruments will pay for themselves many times over by reduction in the number of rejects.

Baking Cycle

Care in metal preparation and control of film thickness will both be wasted unless there is equal attention to the baking cycle. The coatings that have proved best for protecting chromium plate are at least in part of the heat-convertible type. This means that their good properties are not developed unless they are baked in a manner that will accomplish the conversion. A partially cured coating is likely to exhibit only a small fraction of the protection of the same coating when adequately cured. It is obvious that a thin coating on metal will be substantially the same temperature as the metal and, therefore, that the metal temperature controls the rate of cure. When heating is by convection there is a considerable lag between the air temperature and the metal temperature, the amount of lag depending on the thickness of parts and the rate of air circulation. When heating is by radiation instead of by convection, the metal temperature normally rises faster than the air temperature. Some of the newer ovens combine the convection and radiation principles of heat transfer in various degrees. These few facts should make it obvious that it is impossible to specify the cure in terms of air temperature and length of time. It could be specified as a given metal temperature for a given time period, but the measurement of metal temperature with a thermocouple is hardly feasible for daily control of production. This brings us back to the point that our real object is a certain degree of cure, which can be determined by measuring the hardness of the film, most feasibly by the pencil method. It has been found that a hardness of H assures good performance of typical clear coatings on chromium. When a convection oven is used it is only necessary (1) to determine the air temperature and time required in the particular oven to produce a minimum hardness of H and (2) to maintain these conditions. When baking is by infra-red the arrangement of lamps and the conveyor speed should be adjusted so that a hardness of H be obtained. In either case the hardness should be checked at frequent intervals. As a further check on conveyorized convection ovens, a recording thermometer may be sent through at intervals. A typical satisfactory schedule for convection ovens is 30 minutes at 300° F (149° C). This temperature is safe for zinc-base diecastings provided the castings are dense and sound and the plating process has been carried out properly. If these conditions have not been met, it may be necessary to drop the temperature to 275° F (135° C) in order to avoid blistering of the plate.

Stripping

In even the best regulated plants, a small proportion of the finished work will be rejected. This creates the problem of stripping. When fully heat cured the better clear coatings for chromium now in use are remarkably resistant to strippers. In fact, when these coatings made their advent, none of the strippers then available were satisfactory for the purpose. After months of work and several field trials some stripper manufacturers succeeded in developing effective materials. It is now possible to strip in as little as 5 minutes by immersion in a stripper solution at 200° F (93° C). When strippers are evaluated consideration should be given to the physical condition in the stripping bath of the coating that has been removed. Some strippers leave the coating as small particles that tend to cling to the stripped parts; others cause the coating to form into balls and permit the parts to come out of the bath clean.

While creating a stripper problem, the use of clear coatings for chromium solved another problem, that of rack coatings. During the spraying of the parts on

(Continued on page 622)

THIS ARTICLE

discusses an aspect of plating-waste disposal which is not well understood, namely, the problems encountered when the wastes are discharged to municipal sewers. For some time the author has promoted interest in the effects of plating-waste constituents on sewage-treatment processes. Now the Public Health Department of the State of Ohio is to begin an investigation into these matters. This article, therefore, is particularly timely.

Platers in many parts of the country are still indifferent to plating-waste disposal, and some have even criticized this journal for devoting so much space to it. They fail to realize that plating-waste treatment is here to stay and that they are living on borrowed time while many firms in other parts of the country spend much money on the development of better methods and improved engineering to the benefit of all.

The Plating Wastes Problem from the Electroplater's Viewpoint*

A. K. GRAHAM AND H. L. PINKERTON

Graham, Crowley & Associates, Inc., Jenkintown, Pa.

Increasing emphasis on stream-pollution abatement and treatment of electroplating wastes in recent years has focused attention on the very complex nature of the problem. The object of this paper is to discuss several aspects of the problem from the electroplater's viewpoint. An attempt is made to define the electroplating industry and the nature of the plating waste. A distinction is made between plants discharging waste into public waters and into municipal sewers, and the problems related thereto are briefly discussed. Finally, the interdependence of the sanitary engineer (or architect) and the electroplating engineer for successful handling of plating waste problems is emphasized. An additional object of this paper is to effect a better understanding of the plating-waste problem mutually among the several groups concerned—the plating industry, the sewage-treatment group, and those responsible for maintaining the purity of public waters.

The Plating Industry and Plating Waste

The electroplating industry may be considered to cover broadly all kinds of metal finishing and include electroplating, electroforming, chemical coloring, surface treatment with phosphates or chromates, anodizing, painting, and lacquering. The base metals involved may be copper; ferrous alloys, including stainless steels; and alloys of copper, zinc, aluminum, magnesium, and lead. Nonmetallic base materials (such as plaster of Paris and plastics) may also be electroplated. Acids and alkalies, both concentrated and diluted, are used in the preparation of the base surfaces for the various finishes. The plating baths may be acid or alkaline and are almost without exception water solutions of salts of the metals to be deposited. Therefore, the waste from a plating establishment may include any combination of the metals and anions shown in Table I.

It is probably safe to say that the waste from any one plant would never contain all of the constituents listed in Table I, and ordinarily ingredients contributing to B. O. D.† are low. However, plating wastes may vary greatly compared to most plant wastes, since any combination of these constituents may be present and in widely different amounts. Because of

*From a paper presented at 24th Annual Meeting, Federation of Sewage and Industrial Wastes Associations, St. Paul, Minn., October 8–11, 1951. Reprinted with permission Sewage and Industrial Wastes, February, 1952.

†B. O. D. = biological oxygen demand.

TABLE I. POSSIBLE CONSTITUENTS IN ELECTROPLATING WASTE[1]

Metals	Anions
Ammonium	
Sodium	OH
Potassium	SO_4
Calcium	PO_4 (or complex)
Magnesium	NO_3
Aluminum	NO_2
Zinc	Cl
Nickel	F
Cobalt	S
Iron	BF_4
Chromium	CrO_4
Lead	CN (free or complex)
Tin	CNO
Copper	CO_3
Silver[2]	SiO_3 (or SiO_4)
Gold[2]	R_xCOO^-
Indium[2]	R_xSO_3
Platinum group[2]	SO_3 (or equiv. source of SO_2)

[1]Paint waste, solvents, and lubricants may also be present.
[2]These high-cost metals are usually removed by recovery methods.
[3]Such as formates, acetates, citrates, and tartrates, as well as higher fatty acid salts.

this, an analysis of the proper handling and treatment of each plant's waste on an individual basis is essential. Also, the cost of the installation and its operation may vary widely.

The electroplating industry may also be classified as to the type of establishment; namely, (1) job or contract plating shops, and (2) concerns manufacturing a great variety of end products, from automobiles to costume jewelry, and doing most of their own metal finishing. The latter represent about 80 to 90 per cent of the electroplating industry in terms of capacity of facilities installed or quantity of metals and chemicals consumed.

The Waste Problems

It should be pointed out that the chemical nature of the plating waste and the kind of problems which its disposal present are not usually different for the two types of electroplating establishment. Actually, the kind of finishing operations employed in a plant will determine the chemical nature of the waste. This will also have a direct bearing on some of the problems involved in the treatment of the waste. However, the most difficult problems may arise because of the specific location of the plant. This phase of the subject is discussed later.

The plating industry generally recognizes that the treatment of different plating wastes—such as pickle liquor, cyanides, chromic acid or chromates, organic matter of various kinds, and other plating wastes, comprising salts of the heavy metals used in plating—naturally differ. The industry is also seeking needed information on treatment methods, analytical controls, and standards, as indicated by the following activities:

1. Waste-treatment studies under the research program of the American Electroplaters' Society.

2. Related studies on the establishment of standards for waste treatment conducted by the Metal Finishing Industry Actions Committee of the Ohio River Valley Water Sanitation Commission.

3. Company sponsored investigations, as reported from time to time in the technical literature and in private communications.

The trend in much of the latter activity is toward the reduction or complete elimination of certain wastes through engineering improvements in the recovery of spray-paint residues and drag-out from plating and finishing operations, and in the more efficient use of rinse waters. These are among the most promising approaches to the solution of the whole plating-waste problem, as economies effected in the recovery of chemicals and in the reduction of waste to be treated both hasten and encourage compliance on the part of the industry. To emphasize further the economic value of these steps, one need only point out that on the basis of the cost of chemicals alone

1. a pound of sodium cyanide in a waste costs 18 cents, and the chlorine required for its complete destruction costs 80 cents, and

2. a pound of chromic acid in a waste costs 28 cents, and the ferrous sulfate and sulfuric acid required for its complete reduction may cost 23.5 cents, including handling charges.

Plant Location

The influence of a plant's location on the problems encountered in the treatment of waste is not as clearly understood as the technical aspects previously discussed. It is also much more difficult to evaluate. In the case of plants discharging waste directly into public waters, instead of through sanitary sewers, the requirements for treatment not only vary from state to state but also in different localities within a state. Because of this and the fact that conditions vary from one plant to another, the waste problem of each plant must be dealt with individually by the state's engineers. Fortunately, these officials have generally assumed a realistic attitude in these dealings. Had it been otherwise, the industry would be faced with much greater hardships.

Plating plants located in urban areas and obliged to discharge waste into sanitary sewers may be faced with even more serious problems. In the first place, the local municipality is responsible for its own sewer ordinances, which distributes the responsibility more widely than when dealing with state authorities. As pointed out in the "Manual of Practice No. 3" (1949) of the Federation of Sewage and Industrial Wastes Associations, "the specifications of what may and

what may not be discharged to the various types of public sewer systems is a major responsibility of the sewer ordinance. Practice in prevailing codes with respect to this item is again highly variable". Adjustment of the *p*H of the waste to avoid corrosion of the sewer system and interference with the biological reactions is generally required, but there is not too much agreement as to the *p*H value. Some municipalities will accept plating waste with appreciable quantities of B. O. D., suspended solids, or cyanides and copper, whereas others set limits or require substantially complete elimination of certain constituents before the waste is discharged into the sewer.

Under what conditions can these constituents be discharged into sewer systems without adverse effects upon the sewage-treatment processes and what limited amounts can be safely handled? It is of vital importance to the electroplating industry that these questions be answered. The plant discharging its waste into a municipal sewer is always located in an area in which ground or floor space is relatively scarce and costly. Therefore, any waste treatment creates an unusual economic problem and in some instances an impossible space problem.

Cooperation of Engineering Talent

There is one other phase of the plating-waste problem that should be discussed; namely, how a plating concern can best proceed in solving its own waste-disposal problems. There is a tendency to believe that this is a job for the sanitary engineer, although in some instances the responsibility may be assigned to an architect. However, Price recently stated, in a paper presented at the annual convention of the American Electroplaters' Society, "... with few exceptions, consulting engineers will not have a background in electroplating and are likely to be unfamiliar with the special problems of this industry". This point needs special emphasis because of the complexity of the problem and because a treatment plant for plating waste must successfully meet the standards prescribed for the plant effluent. It must also handle any anticipated increase in load or process changes and still operate at the lowest possible cost. To accomplish this, the services of a competent electroplating engineer will be needed who can supply the design data upon which the treatment plant is to be engineered. Fortunately, many of the larger manufacturing concerns have able electroplating engineers in their employ, and competent consultants are also available.

Summary

1. The chemical nature of a plating waste is determined by the kind of plating or finishing operations employed in a plating establishment and not by the type of establishment as defined.

2. The technical problems involved in the treatment of plating waste are generally understood and are being further investigated by the industry.

3. The waste-treatment problems related to a plant's location, i. e., the discharge of waste into public waters or municipal sewer systems, are varied, difficult to define, and require realistic cooperation on the part of state and municipal officials to avoid undue hardships in the industry.

4. There is a need for information about the effect of plating-waste ingredients on sewage-treatment processes which will permit the industry to determine what ingredients may be tolerated, in what concentrations, and under what conditions.

5. Services of a competent electroplating engineer, in addition to those of a sanitary engineer, are required for satisfactory handling of electroplating-waste problems.

FROM DISCUSSION

William S. Wise (*Chief Engineer, State Water Commission, Hartford, Conn.*): It is almost startling to realize how low the concentrations of certain substances may be to affect adversely sewage-treatment processes. For example, if 2 ppm each of copper, zinc, and nickel were discharged constantly to a sewage-treatment plant and if it is assumed that 50 per cent of these metals (1 ppm) were precipitated in the sludge, then the concentration of each would be about 400 ppm. There is not complete agreement on the toxic effect of these metals upon sludge-digestion processes. However, it is generally conceded that up to 100 ppm of copper has a beneficial effect upon digestion, but above 200 ppm the toxic effect becomes increasingly detrimental. The combined effect of these three metals alone might be most damaging.

Furthermore, if low concentrations of chromium reached a sewage-treatment plant employing secondary treatment (either trickling filters, sand filters, or activated sludge), this metal in its chromic and most toxic form would not be precipitated in the sludge but would pass through the settling tanks into the secondary processes and there inhibit nitrification and the biological processes.

In some instances, the treatment of industrial wastes necessary for discharge directly to a waterway would be less stringent, or at least no more stringent, than that required for discharge to a sewer system. Therefore, in such cases, why burden the sewer system with the additional volumes of water? Serious thought should be given to the discharge of detrimental industrial wastes or industrial wastes in general to sewer systems where secondary sewage-treatment processes may become necessary at some future time, because it is possible that such discharges might prevent the use of higher degrees of sewage treatment, especially if biological processes are included. The character and volumes of industrial wastes may change quickly and radically.

Book Review

DR. HAROLD J. READ
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CHEMICAL AND ELECTROPLATED FINISHES by H. Silman, 2nd edition, 1952, xv + 479 pages. Chapman and Hall, Ltd., 37 Essex Street, W. C. 2, London, England. Price, 50 shillings.

The first edition of this book was reviewed in PLATING, page 932, 1948, shortly after its publication, and inasmuch as the new edition does not involve any change of plan or organization, the general remarks offered at that time apply to it. It may be worthwhile to observe, however, that the book has impressed this reviewer more favorably than any other British book on electroplating. The author gives but little attention to antiquated processes, and presents modern techniques and equipment with the emphasis which they deserve.

Mr. Silman has done a very thorough job of revising and modernizing his book without sacrificing any of the good points of the first edition. As the book was read for review, a copy of the first edition was kept at hand and close comparisons were made between the two texts. Notes which were made of significant changes totaled nearly 100 items, and no claim is made that all of the revisions were recorded. Most of them were additions based upon recent developments in the field of metal finishing, and, as a result, the new edition is about 65 pages longer than the first edition.

A particularly noteworthy point is the uniformity with which the text was revised. One so often finds that a revised edition of a book contains only a couple of rewritten chapters, but the review notes on Mr. Silman's work reveal that changes have been made in every chapter. The variety of subjects represented is also indicative of the care with which he has followed the recent literature. The bibliographies at the ends of the chapters have been enlarged to cover the new subject matter in the text.

A notable addition which is not necessarily based on new information is the inclusion of more critical matter in passages where alternative processes are presented. These will be of considerable assistance in making a choice of the process most suitable for a given application. Another item of interest is the increased attention which is given to trouble shooting. The quality of the comments which are offered in this direction make one hope that the author will add more of them in future revisions.

If the book has a weakness, it lies in the rather meager amount of information on the control of plating baths. Modern solutions and processes will not yield the results of which they are capable if they are not subjected to adequate analytical and physical control. Even if the techniques of performing these control tests are not presented, more emphasis should be placed on the necessity for their use.

Clear Protective Coatings

(Continued from page 618)

a rack, the rack is also coated completely. This coating when baked withstands both the cleaning baths and the plating baths. Normally the racks receive a new coating during each complete cycle, and no other rack coating is required. Racks that have been in production for many months have required no attention to the coating. The flaking or powdering in the cleaning cycle has been sufficient to prevent excessive build up.

COATING REPAIR

By comparison with straight metallic coatings, the greatness weakness of organic coatings is that they are much more susceptible to becoming scraped off by the accidental bumping and rubbing that may occur in service. When this happens the local damage needs to be repaired. It is obvious that the coating for this purpose should be suitable for application by brushing or spraying and should not require baking. Coatings of this type have been developed and are now available through automotive retail outlets. In nature they are synthetic varnishes. In performance they fall considerably short of the baked coatings, as would be expected of the air-drying or oxygen-convertible type.

COATINGS ON ZINC

The baked coatings that were developed for chromium have also been tested on buffed zinc-base diecastings and on zinc plated zinc-base diecastings. It is well known that zinc is chemically more reactive than chromium, and hence its need for protection from the atmosphere is even greater. On both buffed zinc-alloy and zinc plate the coatings showed good adhesion and good resistance to salt spray. It is understood that zinc requires a different prepaint conditioning than chromium. The time between conditioning and coating should be as short as possible, preferably no longer than two hours, if good adhesion is to be obtained. Should the use of chromium coatings be prohibited for most civilian purposes, zinc with baked organic coatings can take their place at least in some cases.

Much of the credit for the clear coatings that are being used today on chromium goes to the electroplaters who gave unstinted cooperation to its development, along with constant and vigorous prodding. The work of the coating chemist is never finished, although he cannot claim that he never dies. By continued cooperation the plater can look forward with assurance to still better coatings in the future.

ACKNOWLEDGMENT

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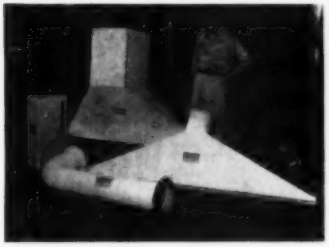

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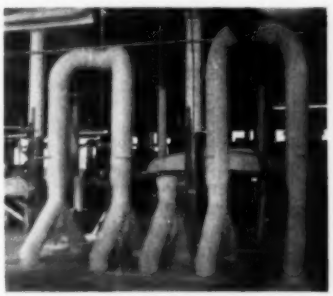

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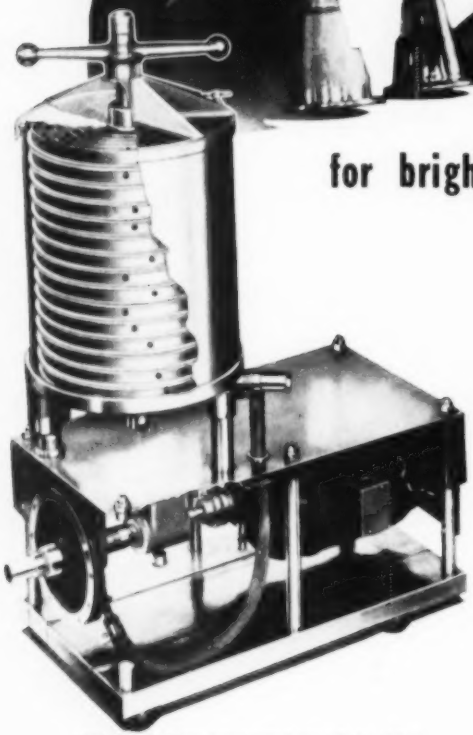

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Polarization and Overvoltage

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(Continued from the MAY 1952 issue)

project No. 8

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*AUTHORS

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[109]F. P. Bowden and E. K. Rideal, "The Electrolytic Behavior of Thin Films. I. Hydrogen. II. The Areas of Catalytically Active Surfaces", Proc. Roy. Soc. **A120**, 59-79, 80-89.—Investigation of the variation of potential of an electrode as the first few atoms are deposited and a study of the catalytic activity and the surface area under different conditions of annealing, rolling, activation and electroplating.

[110]R. D. Durrance and W. C. Gardiner, "Polarization and Resistivity in Nickel Plating Solutions", Trans. Electrochem. Soc. **54**, 303-314.—The anodic and cathodic polarizations and resistivities of various nickel plating solutions were measured with a Haring cell at 17° C.

[18]J. Grant, "Overpotential at Metallic Cathodes. Silver in Neutral and Alkaline Solutions", Trans. Faraday Soc. **24**, 225–233.—A general investigation by both direct and commutator methods. Results of both methods were in close agreement.

[19]J. Grant, "Overpotential of Metallic Cathodes. Cadmium and Antimony in Neutral and Alkaline Solutions", Trans. Faraday Soc. **24**, 367–369.—Results for these metals are in agreement with those for silver. An attempt was made to explain the deviations from the linear ϕH–overvoltage relation.

[20]E. Hedges, "Observations on the Passivity of Metals", J. Chem. Soc. 969–978.—Passivity was found to be similar whether produced by chemical or electrochemical means. Its permanency depends on the type and thickness of the film formed.

[21]E. Liebreich and W. Wiedenholt, "The Question of Cathodic Overvoltage", Z. Elektrochem. **34**, 28–41.—A continuation of previous work in which the course of current-potential curves was determined for the anodic and cathodic polarization of various electrodes in several electrolytes.

[22]A. L. McAulay and D. P. Meller, "Overpotential Produced by Films of Hydrogen Less Than One Molecule Thick", Nature **122**, 170–171.—With a mercury cathode, normal sulfuric acid as electrolyte, and currents of the order of 1 micro-amp/cm^2, overpotentials of 0.3–0.4 volts were produced when less than one-eighth of a unimolecular layer of hydrogen had been deposited.

[23]E. Newbery, "Metal Overvoltage Measurement with the Cathode Ray Oscillograph", Proc. Roy. Soc. **A119**, 680–686.—Repeat measurements of metal overvoltage, this time with the cathode-ray oscillograph, to check previous results and answer objections to previous work with the rotating commutator. They provide further data for the solution of the problem of the origin of transfer resistance.

[24]E. Newbery, "A Revision of the Theory of Transfer Resistance", Proc. Roy. Soc. **A119**, 686–689.—It is now found that transfer resistance occurs only when a gas is liberated at an electrode. The theory of this effect is discussed. It is suggested that transfer resistance is the electrical resistance of a film of gas over the electrode surface.

[25]T. Onoda, "Studies of Overvoltage. IV. Measurement of the Minimum Overvoltage from the Current-Voltage Curves. V. Relation Between Minimum Overvoltage and Current Density", Z. anorg. Chem. **172**, 87–108, 109–120.—Hydrogen overvoltage was determined from current-voltage curves, and oxygen overvoltage was measured with changing current density.

[26]M. G. Raesler and J. Brun, "Hydrogen Overvoltage for Alloys", Z. physik. Chem. **A133**, 15–30.—The current density-potential curves were determined during contact with hydrogen for several alloy types, such as single-phase systems, simple eutectics, eutectic systems with incomplete solid-solution formation, and a system containing a compound. In solid-solution systems, the overvoltage may vary continuously between limiting values for the elements or it may be greater than the normal values of the components. In eutectic system, the overvoltage is not determined by the component which has the lower overvoltage but varies more or less regularly between characteristic values of the components. It can be said that overvoltage in a general way follows the structures.

[27]H. Seto, "Electrolytic Zinc Refining. II. The Influence of Foreign Elements upon the Hydrogen Overvoltage", Hokko **24**, 1–22; Chem. Abs. **23**, 2107 (1929).—A general investigation conducted mainly with gelatin and cinchonine resulted in increased polarization. Overvoltage was found to be smaller for spongy deposit than for dense deposits.

[28]E. I. Shpitalskii and V. V. Pichetn, "An Experimental Study of the Electrochemical Polarization of Platinum", J. Russ. Phys. Chem. Soc. **60**, 1351–1381; Chem. Abs. **23**, 3170 (1929).—The use of the authors' commutator made it possible to measure the electromotive force of the cell $Pt|O_2|1-N\ H_2SO_4||1-N\ H_2SO_4|$ $1-N\ H_2SO_4$, $Hg_2SO_4|Hg$ while the current was flowing through it as well as at certain time intervals after the circuit had been opened.

1929

[29]F. P. Bowden, "Amount of Hydrogen and Oxygen Present on the Surface of a Metallic Electrode", Proc. Roy. Soc. **A125**, 446–462.—The author measured the quantity of electricity necessary to remove hydrogen atoms alternately adsorbed with metallic atoms and substitute equivalent oxygen atoms in presence of platinum oxide. From the data the author concluded that there is insufficient gas to establish a complete gas envelope.

[30]F. P. Bowden, "The Kinetics of the Electrodeposition of Hydrogen and Oxygen", Proc. Roy. Soc. **A126**, 107–125.—A study of the kinetics of the electrodeposition of hydrogen and oxygen on metallic surfaces.

[31]B. Bruzs, "Temperature Measurements on Electrodes in Operation. I. II", Z. physik. Chem. **A145**, 283–288, 470–476.—A general investigation with a discussion of the application of the results to the phenomenon of overvoltage, with temperature rise being directly proportioned to the current density.

[32]B. Clark and E. O. Jones, "The Effect of Addition Agents upon the Conductivity, Cathodic Polarization and Grain Size of Deposits Obtained from the Cell: Copper-Copper Sulfate, Sulfuric Acid-Copper", Trans. Faraday Soc. **25**, 582–590; J. Electrodepositors' Tech. Soc. **5**, 21–28.—An investigation to determine whether the suggested relationship between cathodic polarization and grain size of deposit exists and the effects of addition agents. Addition agents increased cathode polarization, decreased conductivity, and reduced grain size. But no simple relationship was found between grain size and cathode polarization. The larger the polarization, the more uniform was the deposit in thickness.

[33]F. Giordani and B. Focaccia, "Studies on Polarization Phenomena. Preliminary Notes", Gazz. chim. ital. **59**, 914–926.—An oscillographic method is described for measuring the potential at an electrode during polarization and depolarization.

[34]N. A. Izgarishev and H. Ravikovich, "The Activation of Chemical Reactions by Neutral Salts. V. The Effect of Neutral Salts on Cathodic Polarization", Z. physik. Chem. **A140**, 235–244.—The effect of addition of salts to nickel chloride solutions was investigated with reference to the current density–voltage curves for the electrodeposition and current yield of nickel.

[35]J. F. Kern and R. W. Bowen, "Electrode Potential of Copper Anodes and Copper Cathodes", Trans. Electrochem. Soc. **56**, 379–385.—Electrode potentials of copper anodes and cathodes were determined, as well as the effect on the electrode potentials of temperature, composition of electrolyte, composition and physical character of anodes, and additions of glue and sulfite-waste residue.

[36]W. V. Lloyd, "The Overpotential of Bismuth in Acid Solutions", Trans. Faraday Soc. **25**, 525–529.—The maximum commutator overpotential of bismuth is independent of the ϕH of the electrolyte and is 0.1 volt greater than that of antimony in acid solution.

[37]W. J. Mueller and K. Konopicky, "The Theory of Passivity Phenomena. X. Time Formula for Self-Passivation", Monatsh. **52**, 463–473.—A formula was developed, and several examples of its application were given.

[38]M. G. Raesler and D. Eljestad, "Hydrogen Overvoltage on Alloys", Z. physik. Chem. **A140**, 124–132.—Hydrogen overvoltages were determined from current-potential curves for a variety of alloys, and previously published results were corrected.

[39]P. Sederholm and C. Benedicks, "Studies of Overvoltage on Metals", Trans. Electrochem. Soc. **56**, 169–186.—A general investigation, with some theoretical interpretations of the nature of overvoltage.

[40]E. E. Zimmerman, "The Effect of Temperature Treatment on the Establishment of a Stable Condition of the Electrodes in a Polarization Cell", Phys. Rev. [2] **33**, 277.—A method was described for effectively reducing freshly polished gold and platinum electrodes to

a stable condition in a short period of time.

[1930]

[1]T. Baars and C. Kayser, "Hydrogen Overvoltage. I. Cathodic Hydrogen Evolution at Low Current Density and the Question of the Minimum Overvoltage", Z. Elektrochem. **36**, 428-439.—An apparatus was described and explanation was given of why on certain metals and below a certain current density the quantity of evolved hydrogen falls below that required by Faraday's law. This deficiency was found due to a number of factors such as solubility, diffusion, convection and solution of some of the electrode.

[1930]

[2]T. Erdey-Gruz and M. Volmer, "The Theory of Hydrogen Overvoltage", Z. physik. Chem. **A150**, 203-213.—A theory of overvoltage was developed which gives the absolute value of the constant b = 0.116 from the Tafel Equation.

[3]H. Flood, "The Hydrogen Overvoltage of Cadmium", Kgl. Norske Videnskab. Selskabs. Forh. **B3**, 112-115.—A general study of current-potential curves for cadmium against a hydrogen electrode in sulfuric acid solution.

[4]S. Glasstone, "Studies of Electrolytic Polarization. IX. Complex Cyanides; v. Zinc, Cadmium and Mercury", J. Chem. Soc. 1237-1247.—Cathodic-potential and current-efficiency measurements were made in solutions containing complex cyanides of zinc, cadmium and mercury. The results were influenced by variation of the electrode potential with increasing ratio of cyanide to metal, the potential of hydrogen formation at the specific metal, and the concentration of the bath.

[5]B. M. Keckberg and V. Joffe, "Electrical Conductivity and High-Voltage Polarization of Saltpeter Crystals", Z. Physik **66**, 172-191.—A general study, which led to the conclusion that the space charge is concentrated in thin layers at both electrodes and is attributed to impurities, since the polarization decreases with increased purity of the crystal.

[6]N. Kobozev and N. I. Nekrasov, "Formation of Free Hydrogen Atoms During the Cathodic Polarization of Metals", Z. Elektrochem. **36**, 529-544.—The emission of free hydrogen atoms from the cathode surface of platinized platinum, peleched platinum, palladium, nickel, tin, copper, zinc, lead and mercury during polarization was demonstrated by the reducing action on a tungstic oxide suspension, and a complete parallelism was found between this emission and the overvoltage of the metal.

[7]W. V. Lloyd, "The Overpotential of Arsenic and the Yields of Arsine at an Arsenic Cathode in Acid Solutions", Trans. Faraday Soc. **26**, 15-18.—A general investigation in sulfuric, hydrochloric, phosphoric, oxalic, and tartaric acid solutions.

[8]W. J. Mueller, "Basis of the Theoretical Significance of the Passivity of Metals", Z. Elektrochem. **36**, 365-371.—A theory of passivity based on a polarized surface film upon electrodes was disclosed.

[9]W. J. Mueller, "The Theory of Surface Polarization", Z. Elektrochem. **36**, 679-685.—The present conflicting theories were reconciled by assuming that each of the three principal mechanisms previously proposed (the oxide-film theory, the oxygen theory and the metal theory) participate.

[10]W. J. Mueller, "Theory of Passivity. XII.—The Passage of Current Through Anodes Which Are Covered with an Insoluble Layer", Monatsh. **56**, 191-196.—With the aid of Kirchhoff's law, the relation between the current in the coating layer and that in the pores of a coated anode is expressed in a formula.

[11]L. Newbery, "The Theory of Electrodes", Trans. Electrochem. Soc. **58**, 187-216.—The entire theory of electrode behavior is reviewed, including single-potential determinations, overvoltage, transfer resistance, valve action, and passivity.

[12]M. G. Raeder, "Hydrogen Overvoltage", Tids. kemi Bergvesen **10**, 37-40, 56-59.—A theoretical discussion.

[13]H. J. S. Sand, "Hydrogen Overpotential in Acid Solution", Trans. Faraday Soc. **26**, 19-26.—A theoretical discussion of the hydrogen overpotential in acid solutions was developed from the "double layer" hypothesis. According to this theory one assumes the double layer to consist of a film of electrons attached to the electrode and a film opposite in charge of protons, usually hydrogen, in the electrolyte.

[14]E. I. Shpitalskii and N. I. Nekrasov, "The Cathodic Polarization of Mercury", Z. physik. Chem. **A147**, 321-344.—The cathodic potential of mercury was studied as a function of current density, atmosphere, time, and *p*H of the electrolyte.

[15]W. J. Shutt and V. J. Stirrup, "The Time Factor in Anodic Passivation of Metals", Trans. Faraday Soc. **26**, 635-642.—Passivation of gold in 2 — N hydrochloric acid was studied with a rotating commutator, time, current and potential being recorded on an oscillograph.

[16]A. Smits, "Passivity and Overvoltage", Z. Elektrochem. **36**, 20-25.—The better-known theories were discussed and criticized. Two new ideas were developed, namely, that the ions of different valence in the metal are formed before the quantum number of valence electrons changes and that the film of oxide modifies the static potential of the metal.

[17]S. Swann, Jr. and E. O. Edelmann, "Hydrogen Overvoltage in Glacial Acetic Acid", Trans. Electrochem. Soc. **58**, 179-185.—The overvoltages of hydrogen on several different cathodes at various current densities were shown to be much greater in glacial acetic acid than in sulfuric acid under the same conditions.

[18]E. E. Zimmerman, "The Influence of Temperature on Polarization Capacity and Resistance", Phys. Rev. [2] **35**, 543-553.—A general investigation for gold and plain platinum electrodes which showed that the temperature coefficient of capacity is independent of concentration. The value for platinum electrodes was approximately twice that for gold. For platinum electrodes resistance increased with frequency, but for gold it decreased.

[1931]

[19]T. Erdey-Gruz und G. G. Kromrey, "Polarization Capacity of Mercury Electrodes", Z. physik. Chem. **A157**, 213-241.—Measurements of the polarization of a mercury electrode in aqueous mercurous nitrate solutions showed that at very high dilutions the polarization effects may be traced solely to the Helmholtz double layer, but that as the concentration increases, concentration polarization plays a more and more important part until at the higher concentration it becomes entirely responsible for the observed polarization.

[20]T. Erdey-Gruz and M. Volmer, "Overvoltage of Metals", Z. physik. Chem. **A157**, 165-181.—Measurements showing that overvoltage is a linear function of current density indicated that the slowest process in the separation of a metal by electrolysis is the rate at which layers of metal spread over the crystal surface from the edges or corners.

[21]S. Glasstone, "The Limiting Current Density in the Electrodeposition of Noble Metals", Trans. Electrochem. Soc. **59**, 277-287.—An equation was developed on assumption the maximum rate of deposition is equal to the maximum rate at which the ions containing the metal to be deposited can diffuse to the cathode.

[22]R. W. Gurney, "The Quantum Mechanics of Electrolysis", Proc. Roy. Soc. **A134**, 137-154.—A theory based on quantum mechanics and dealing with electrode potentials, overvoltage and neutralization of ions was developed to account for observations of Bowden.

[23]W. V. Lloyd, "The Reduction of Arsenic Acid and Arsenates to Arsine at the Mercury Cathode. I", Trans. Faraday Soc. **27**, 89-94.—An investigation of electrolytic reduction of arsenic acid and measurement of overvoltages concerned.

[24]V. V. Picheta, "Anodic Polarization of Smooth and Platinized Platinum", J. Gen. Chem., U. S. S. R. **1**, 377-387; Chem. Abs. **26**, 3733 (1932).—The potential at platinum anodes during passage of current depended on formation of film of oxygen or a suboxide. On current interruption, the potential depended on the accumulation of oxygen. Depolarization potentials were inversely proportional to the current density for both smooth and platinized platinum.

[25]P. Reentgen and R. Buchkremer, "The Fundamentals of the Commercial

Electrodeposition of Zinc", Metallwirtschaft **10**, 931–936.—A general discussion of tests covering the effect of time of measurement on cathode potential and hydrogen overvoltage; surface condition of cathode, temperature and acid concentration on hydrogen overvoltage; and zinc content of electrolyte, temperature and acid concentration on the cathode potential of electrolytes containing zinc.

[28]M. deK. Thompson, "The Relation Between the Hydrogen Overvoltage and Composition of Brass", Trans. Electrochem. Soc. **59**, 115–119.—The hydrogen overvoltages on brass were measured for compositions varying from pure copper to pure zinc. There was no close connection between the overvoltage and the equilibrium diagram.

[29]M. deK. Thompson and A. L. Kaye, "Hydrogen and Oxygen Overvoltage on Nickel-Iron Alloys", Trans. Electrochem. Soc. **60**, 229–234.—A study of hydrogen and oxygen overvoltages of the iron-nickel series of alloys in nodal potassium hydroxide at 25° C. There was no connection between overvoltages and equilibrium diagram.

1932

[30]J. A. V. Butler, "The Mechanism of Overvoltage and Its Relation to the Combination of Hydrogen Atoms at Metal Electrodes", Trans. Faraday Soc. **28**, 379–382.—A mathematical explanation of overvoltage and mechanism of hydrogen-atom formation on electrode surfaces.

[31]J. A. V. Butler and G. Armstrong, "Electrochemical Periodicities", Nature **129**, 613–614.—An investigation of periodicities observed in course of experiments on the anodic polarization of platinum electrodes in dilute sulfuric acid solutions saturated with hydrogen. A tentative mechanism was presented.

[32]J. A. V. Butler and G. Armstrong, "The Kinetics of Electrode Processes. I. Depolarization Effects by Hydrogen and Oxygen at Platinum Electrodes", Proc. Roy. Soc. **A137**, 604–621.—The anodic and cathodic polarization of platinum electrodes in solutions saturated with hydrogen and oxygen at current densities between 0.5 and 30 x 10^{-3} amp/cm² were studied.

[33]T. Erdey-Gruz and H. Wick, "The Deposition Potential of Mercury on Foreign Electrodes", Z. physik. Chem. **A162**, 63–70.—The polarization potential necessary to deposit the first mercury nucleus on an electrode was calculated. Because of "active" points on the electrodes, mercury began to deposit at a voltage lower than calculated.

[34]T. Erdey-Gruz and H. Wick, "Hydrogen Overvoltage", Z. physik. Chem. **A162**, 53–62.—An investigation of hydrogen overvoltage on electrodes of lead, tantalum and especially prepared carbon with very clean surfaces. Authors found the equation: Overvoltages $n = a + b \log i$, where i is current density, and a and b are constants. For most metals b is approximately 0.116. The authors found b for carbon to be 0.115; others have reported it as high as 0.84. Lead and tantalum are anomalous.

[35]A. D. Ferguson and G. M. Chen, "An Improved Commutator and Some Sources of Error in the Commutator Method for the Measurement of Overvoltage", J. Phys. Chem. **36**, 1156–1165.—A commutator was described, which is capable of measuring charge or discharge potentials within 0.0003 seconds of the beginning or end of the charge or discharge intervals for the electrodes, either separately or combined. Sources of errors were discussed.

[36]A. L. Ferguson and G. M. Chen, "The Measurement of Polarization by the Direct and Commutator Methods", J. Phys. Chem. **36**, 1166–1177.—Potentials were measured within 0.0005 seconds from the end of charge or beginning of discharge. Every potential drop in the circuit was measured, and their sum compared with the source potential.

[37]A. L. Ferguson and G. M. Chen, "Studies on Overvoltages. V. A Moving Coil Oscillograph Commutator System for the Study of Overvoltages and Transfer Resistance", J. Phys. Chem. **36**, 2437–2445.—A general investigation confirming previous work with the commutator-potentiometer system.

[38]H. Flood, "Hydrogen Overvoltage on Alloys", Z. physik. Chem. **A159**, 131–134.—It was stated that, in general, overvoltages do not reliably predict structure changes. The homeopolar crystals in electrolysis grow from the corners, whereas solution of homeopolar crystals begins at the corners and edges with growth developing more easily on the face.

[39]H. Fricke, "The Theory of Electrolytic Polarization", Phil. Mag. [7] **14**, 310–318.—Mathematical equations were deduced for polarization resistance and counter electromotive force on the passage of alternating current of low density between a metal electrode and an aqueous solution.

[40]S. Glasstone, "Electrolytic Polarization. X. Amines of Copper, Silver, Zinc and Cadmium", J. Chem. Soc. 2849–2857.—Cathode-potential measurements were made in solutions containing amines. The results were interpreted by means of the electrometric-titration curves and by the theory of limiting current.

[41]S. Glasstone and G. D. Reynolds, "The Influence of High Frequency Currents on Polarized Electrodes. I", Trans. Faraday Soc. **28**, 582–596.—The depolarizing effect of high-frequency (10⁶-cycle) currents on small polarized electrodes of platinum and lead were studied with a vacuum-tube oscillator. The data collected were used to explain the mechanism of the electrolytic detector.

[42]R. W. Gurney, "The Quantum Mechanics of Electrochemistry", Proc. Roy. Soc. **A136**, 378–391.—The parallelism of the electrochemical order of the elements and the Volta contact series was proved, and general expressions for electrode potentials and interface potentials were derived.

[43]T. Ishihara, K. Mihara and K. Ueta, "The Polarization Potential of Zinc Deposited from Aqueous Solutions", Kinzoku-no-Kenkyu **9**, No. 6, 244–278; Chem. Abs. **26**, 5502.—The cathodic polarization potential, the anodic overvoltage and the total polarization potential in the electrolysis of 36 aqueous solutions of zinc sulfate of different concentrations and *p*H were measured by a direct method with the normal calomel electrode.

[44]Y. Kato, "Hydrogen Overvoltage of Lead and Lead-Antimony Alloys", J. Electrochem. Soc. (Japan) **129**-**124**, 161–167; Chem. Abs. **27**, 2628 (1933).—The hydrogen overvoltages of lead and lead-antimony (1–10 per cent) alloy cathodes were determined at various current densities, temperatures, time periods and surfaces. The results showed continuous variation from 1 to 10 per cent antimony on either slow or fast cooling of the alloys. The hydrogen overvoltage for lead depended on the surface; it was high on a smooth surface and low on a rough surface.

[45]E. Mueller and K. Schwabe, "The Limiting Current in the Anodic Polarization of Metals in Aqueous Solutions. The Theory of Passivity", Z. Elektrochem. **38**, 407–418.—The behavior of thallium, lead, cadmium, copper and zinc as anodes in unsaturated and saturated solutions of their salts with increasing anode potentials was studied. It was concluded that no sharp boundary can be drawn between passivity and activity.

[46]P. Roentgen and R. Buchkremer, "The Influence of Metallic Impurities Upon Technical Zinc-Electrolysis", Metall u. Erz **29**, 449–456.—The effects of a variety of metal ions upon current efficiency and hydrogen overvoltage in the electrowinning of zinc were discussed. The effects of these factors upon the physical and chemical nature of the deposit were described and shown photographically.

[47]M. Schloetter and J. Korpium, "The Throwing Power of Plating Baths", Trans. Electrochem. Soc. **62**, 129–143.—A number of mathematical equations were derived, embodying cathode-polarization voltage, condition of the bath, operating current densities and current efficiencies, by which the throwing power of commercial plating baths may be calculated.

[48]W. J. Shutt and A. Walton, "The Passivity of Gold", Trans. Faraday Soc. **28**, 740–752.—A study of the fall in potential during the spontaneous reactivation of a passivated gold anode by means of a commutator and two oscillographs.

1933

[49]G. Armstrong and J. A. V. Butler,

"The Rate of Decay of Hydrogen and Oxygen Overvoltage". Trans. Faraday Soc. **29**, 1261-1266. The rate of decay for hydrogen and oxygen were independent of the electromotive process for any of the products formed during electrolysis.

[96] G. Armstrong, F. B. Hunsworth and J. A. V. Butler. "The Kinetics of Electrode Processes. III. The Behavior of Platinum and Gold Electrodes in Sulfuric Acid and Alkaline Solutions Containing Oxygen". Proc. Roy. Soc. **A143**, 89-103.

The experiments supported the view that a single layer of adsorbed oxygen atoms is formed on anodic polarization of platinum in sulfuric acid or alkaline solutions. On cathodic polarization the reduction of the adsorbed layer occurs simultaneously with depolarization by dissolved oxygen in solution.

[97] R. Dubois. "The Initial Overvoltage of Hydrogen on a Mercury Cathode". Compt. rend. **196**, 833-835. The electromotive force of a mercury cathode against a platinum anode was measured as a function of current density and showed that the initial overvoltage is nil.

[98] A. L. Ferguson and G. Dubpernell. "Studies on Overvoltage. VI. The Mechanism of the Transfer of Electrolytic Hydrogen and Oxygen Through Thin Sheets of Platinum and Palladium". Trans. Electrochem. Soc. **64**, 221-248. A general study. Previous work in the field was critically reviewed and inconsistencies were satisfactorily explained. A general theory was developed.

[99] A. Frumkin. "Hydrogen Overvoltage and Structure of the Double Layer". Z. physik. Chem. **A164**, 121-133. Consideration of the potential distribution in the theory of hydrogen overvoltage led to a relation between the overvoltage and the electrokinetic potential.

[100] S. Glasstone and G. D. Reynolds. "The Influence of High Frequency Currents on Polarized Electrodes. II". Trans. Faraday Soc. **29**, 399-406. A general study of the effect of oscillations of 107 cycles per second on the limiting current for 100 per cent efficiency using platinum electrodes.

[101] K. F. Gibbles and W. A. Patrick. "Polarization Current Due Solely to Changes in Electrode Area". J. Am. Chem. Soc. **55**, 3594-3602. The adsorption of mercury ions at a mercury surface were studied by measurement of the current flowing between two mercury electrodes immersed in sulfuric acid solution while one of the electrodes was undergoing a slow increase in area.

[102] R. W. Gurney. "Quantum Mechanics and Overvoltages". Physik. Z. U.S.S.R. **4**, 360-364; Chem. Abs. **28**, 416 (1934). The electrical double-layer is transparent to an electron wave; hence the transfer of electrons to and from ions may occur at some distance from the electrode surface. Overvoltage facilitates such electron transfer.

[103] H. L. Lochte. "The Electrochemical Behavior of Iron in Corrosion Cells. II. The Cathode". Trans. Electrochem. Soc. **66**, 173-181. Potential-time curves showed the effect of current density, oxygen concentration and type of anion present on the potential of iron as cathode against zinc as anode. A number of regularities were pointed out.

[104] M. G. Raeder. "Hydrogen Overvoltage and Recombination Catalysis". Kgl. Norske Videnskab. Selskab. Forh. **5**, 76-79. The relation between overvoltage and catalysis of the recombination of hydrogen atoms was confirmed with alloys of lead and thallium.

[105] G. Semerano. "The Overvoltage of Hydrogen and the Phenomena of Adsorption at the Mercury-Drop Cathode". Gazz. chim. ital. **63**, 786-801. After a discussion of modern views of overvoltage phenomena, experiments were described confirming the effects of neutral salts on the deposition of the hydrogen ion on a mercury-drop cathode in the electrolysis of acid solutions.

[106] R. Taft. "Theories of Addition Agent Action". Trans. Electrochem. Soc. **63**, 75-85. An explanation of the reduction of cathode polarization which accompanies the use of certain addition agents was advanced along with theories for two types of addition-agent action: (1) where the addition agent is actually included within the deposit, (2) where the addition agent is reduced simultaneously with the metal ion.

[107] N. Thon. "The Electrolysis of Solutions of Metallic Salt with a Rarified Gas Cathode". Compt. rend. **197**, 1114-1117. A general investigation, with results agreeing with Volmer's theory of electrolytic polarization of metals, according to which the overvoltage disappears only at active points of a crystalline network.

[108] M. Volmer. "Overvoltage". Physik. Z. U.S.S.R. **4**, 346-359; Chem. Abs. **28**, 416 (1934). The author modified Tafel's theory by adding the concept of an activation energy necessary for the discharge of ions through the double layer.

1934

[109] R. P. Bell. "The Theory of the Electrolytic Separation of Isotopes". J. Chem. Phys. **2**, 164-166. Gurney's treatment of overvoltage was applied to the relative rates of discharge of 2 isotopes. It was concluded that the efficiency of separation is nearly independent of electrode material and current density; however, conditions are less favorable for the separation of the heavier elements.

[110] W. Blum and G. W. Vinal. "The Definition of Polarization, Overvoltage and Decomposition Potential". Trans. Electrochem. Soc. **66**, 359-367. From a consideration of the electrolysis of water with smooth platinum electrodes as an example, the fundamental components of the cell or bath voltage were interpreted. Revised definitions were proposed and discussed.

[111] O. A. Esin. "Overvoltage Theory and Simultaneous Discharge of Ions". Z. physik. Chem. **A171**, 341-347. The equation for the distribution of current among different ions discharged simultaneously at an electrode in irreversible electrolysis was deductively derived from the overvoltage theory developed by Volmer.

[112] A. L. Ferguson and G. M. Chen. "Studies on Overvoltage. VII. Electrode Discharge Phenomena Studied by Means of an Electromagnetic Interrupter Together with an Oscillograph". J. Phys. Chem. **38**, 1117-1125. Discharge curves obtained with an electromagnetic interrupter and an oscillograph showed no indication of an IR drop due to surface resistance.

[113] C. G. Fink, H. C. Grey and D. B. Lake. "The Diffusion of Hydrogen Through Metals; Fractionating the Hydrogen Isotopes". J. Chem. Phys. **2**, 105-106. A general investigation, concluding with the calculation that on the basis of overvoltages involved, the pressures of hydrogen passing through the metal are of the order of a million atmospheres.

[114] C. F. Holmboe. "The Cathodic and Anodic Polarization in Aqueous Alkali Solutions and the Influence of the Time Factor". Z. Elektrochem. **40**, 366-370. From tests made it is concluded that polarization-potential measurements depend to a large extent upon the time factor.

[115] I. Krasso. "Influence of the Overvoltage of Cathodic Hydrogen upon the Strength of Various Sorts of Steel". Z. Elektrochem. **40**, 826-829. This general study concluded that the penetration of hydrogen is associated with a limiting overvoltage below which penetration is infinitely slow and that additions of arsenic and mercury increase the overvoltage above the limit, causing brittleness.

[116] N. Moriguchi. "The Effect of Supersonic Waves in Chemical Phenomena. III. The Effect on the Concentration Polarization. IV. The Effect on Overvoltage". J. Chem. Soc., Japan **55**, 749-754; Chem. Abs. **28**, 7120. When supersonic waves were applied in the electrolysis of 0.1 — N copper sulfate the voltage-current density curve became a straight line, and the overvoltage in the electrolysis of 1 — N potassium hydroxide, sodium hydroxide and sulfuric acid was eliminated when supersonic waves are applied. The supersonic wave is supposed to eliminate the diffusion layer between electrode and electrolyte.

[117] E. Mueller and K. Schwabe. "The Limiting Current in the Anodic Polarization of Metals in Aqueous Solutions. IV". Z. Elektrochem. **40**, 862-870. A general study of lead anodes polarized in solutions of numerous organic and inorganic salts.

[118] W. J. Mueller. "The Theory of Pas-

sivity Phenomena. XXII. A Unification of Passivity Phenomena by Means of the Film Theory of Passivity", Z. Elektrochem. **40**, 119–125.—A review which showed that most passivity phenomena can be accounted for quantitatively by formation of a sparingly conducting film on the metal anode. Such a film probably consists of a metal salt or basic salt which causes a progressive loss of the effective surface area of the electrode and a rise in the current density.

[278]L. V. Nikitin, "Acoustic-Electrochemical Phenomena", C.rnpt. rend. acad. sci., U. S. S. R. **4**, 309–312.—The effect of an audible frequency on the polarization of an iron electrode in 5 per cent sulfuric acid solution was investigated with the aid of an oscillograph.

[279]P. P. Pozdirov, "Role of the Contact (or Transfer) Resistance in Connection with Hydrogen Overvoltage", J. Gen. Chem., U. S. S. R. **4**, 1311–1321; Compt. rend. acad. sci., U. S. S. R. **1**, 386–390 (1935); Chem. Abst. **29**, 3919 (1935).—On the surface of a mercury electrode, with a low cathode polarization, a film of hydrogen forms causing contact resistance. With an increase of cathode potential, the average film thickness increases gradually, and with that the contact resistance increases. The contact resistance reaches a maximum, then decreases because of gas film turbulance.

[280]A. G. Samartzev and K. S. Evstrop'ev, "Potential of Formation and Deposition of Metals on an Indifferent Electrode", Bull. acad. sci., U. S. S. R., Classe sci. math. nat. 603–613.—An experimental study was made of the deposition of cadmium, silver, copper, lead and mercury from aqueous solutions of their salts on a platinum electrode. It was found that the deposition of the first traces of metal begins at some overvoltage above that required for the normal separation of the metal.

[281]V. V. Shishkin, J. P. Matveichuk and I. I. Gekht, "Reversibility of the Potential of a Polarizable Hydrogen Electrode", J. Phys. Chem., U. S. S. R. **5**, 126–132.—A general study.

[282]I. Zlotowski, "Investigations of Cathodic Polarization of Metal Electrodes by Means of the Heyrovsky and Shikata Polarograph. I. Investigation of Cathodic Polarization of Solid Metal Electrodes. II. Study of the Overvoltage Phenomenon Appearing in Electrodeposition of Metallic Ions. III. The Theory of the Overvoltage of Hydrogen", Bull. intern. acad. polonaise, Classe sci. math. nat. (A) 115–126; Roczniki Chem. **14**, 640–690; Chem. Abs. **29**, 1328–6511 (1935).—A general investigation.

1935

[283]J. P. E. Duclaux, "Effect of Light on Anodic Polarization of Tungsten", Compt. rend. **200**, 1838–1840.—The rapidity of depolarization of a tungsten anode in acid solution was greatly increased by ultra-violet light, an effect probably due to displacement of the oxidation-reduction equilibrium.

[284]O. A. Esin, A. I. Balabai and A. Matantzev, "Simultaneous Discharge of Ions of Metals and of Hydrogen from Solutions of Complex Cyanides", J. Phys. Chem., U. S. S. R. **6**, 1071–1077; Z. physik. Chem., Abs. **A173**, 216–222.—The application to the mutual discharge of ions of the equation derived from Volmer's theory of overvoltage was tested by means of the separation of hydrogen and metal ions from complex cyanide solutions. The tests showed good agreement between the equation and experimental results.

[285]O. A. Esin and A. Levin, "Cathode Polarization During Deposition of Copper from Sulfate Solutions", J. Gen. Chem., U. S. S. R. **5**, 1302–1315; Chem. Abs. **30**, 965 (1936).—A study of deposition potentials of copper at 25° C from solutions containing various concentrations of copper sulfate in 2 concentrations of sulfuric acid, 0.1- and 0.2-N, at current densities of 1 ma/cm² and up.

[286]O. A. Esin and A. Matantzev, "Polarization of Electrodes During the Deposition of Metals from Solutions of Complex Cyanides", Z. physik. Chem. **A174**, 384–394.—A general discussion and analysis of data showed that polarization is a result of cyanide radical accumulating on the cathode. In this respect the radical behaves like hydrogen and creates the overvoltage.

[287]A. L. Ferguson and G. M. Chen, "Studies on Overvoltage. VIII. Overvoltage at Bright Platinum Electrodes in Two Normal Sulfuric Acid for Low Current Densities Determined with an Oscillograph", J. Phys. Chem. **39**, 191–198.—An investigation which led to the conclusion that there is no transfer resistance at the surface of smooth platinum electrodes.

[288]S. Glasstone and A. Hickling, "Hydrogen Peroxide Theory of Electrolytic Oxidation and the Influence of the Electrode Surface on Anodic Processes", Trans. Faraday Soc. **31**, 1656–1660.—The results of this study showed that overvoltages cannot be correlated in any simple manner with the efficiencies in the oxidation of acetate, thiosulfate and sulfite ions and that no one mechanism is likely to account for the various types of anodic oxidation.

[289]B. Gross, "A New Arrangement for Measuring Polarization Voltage", Physik. Z. **36**, 648–649.—A description of special apparatus.

[290]W. H. Hunter and L. F. Stone, "Studies on Organic Depolarizers", J. Phys. Chem. **39**, 1139–1147.—A general study of single potentials of numerous organic substances against cathodes of platinum, gold, silver, nickel and tin.

[291]G. Jones and S. M. Christian, "Measurement of the Conductance of Electrolytes. VI. Galvanic Polarization by Alternating Current", J. Am. Chem. Soc. **57**, 272–280.—Using a conductivity cell with movable electrodes to measure the resistance and capacitance caused by galvanic polarization with alternating current of silver, nickel and platinum electrodes, the authors showed that polarization resistance is inversely proportional to the square root of the frequency.

[292]F. O. Koenig, "Observations on the Effect of Mechanical Agitation on Electrode Potential", J. Phys. Chem. **39**, 455–463.—An investigation of silver electrodes in potassium chloride solution saturated with silver chloride showed that vibrating and stirring aid diffusion and keep the oxygen concentration in equilibrium with the mass of solution.

[293]E. Mueller and W. Stein, "The Cathode Film in the Electrolysis of Chromic Ion-Containing Solutions", Z. physik. Chem. **A172**, 348–352.—Gold and platinum became covered with an invisible film on cathodic polarization, whereas baser metals needed merely to be dipped in dichromate solutions. The existence of the film was shown by its interference with the deposition of silver from a cyanide solution.

[294]T. Noguchi, "The Electrolytic Polarization Capacity and the Atomic Mechanism of Hydrogen Electrodes", J. Electrochem. Assoc. (Japan) **3**, 141–149; Chem. Abs. **29**, 5750.—A general study of the alternating-current polarization capacity of platinum electrodes.

[295]G. Perfil'ev, "The Hydrogen Film on a Polarized Metallic Cathode", Sotzialist Rekonstruktziya i Nauke, No. 3, 168; Chem. Abs. **29**, 7826.—The polarization capacity of a hydrogen film formed on the electrode during cathodic polarization depended upon the density and frequency of the alternating current.

[296]P. P. Profirov, "Capacity Measurement of the Polarized Mercury Electrode", Compt. rend. acad. sci., U. S. S. R. **2**, 542–547; Chem. Abs. **29**, 7825.—A general investigation with alternating current.

[297]M. G. Raeder and K. W. Nilsen, "Hydrogen Overvoltage and Poisoning Phenomena", Kgl. Norske Videnskab. Selskabs Skrifter **II**, No. 26, 1–19; Chem. Abs. **30**, 7462 (1936).—The overvoltages of platinum and nickel electrodes were measured against electrodes poisoned with mercury, arsenic, lead and copper under a hydrogen atmosphere. A relation was found between the constant *b* in Tafel's equation and the quantity of poison.

[298]W. J. Shutt, "Anodic Passivation", Trans. Faraday Soc. **31**, 636–637.—Reasons were given for the rejection of a diffusion layer as an explanation for the anodic passivation of gold. Vigorous stirring was assumed to reduce the diffusion layer to molecular dimensions, with the data obtained being a measure of formation of an adsorbed film.

[299]A. Smits, "The Delayed Discharge of Ions as the Cause of Hydrogen Over-

Washington Orders

Copies of NPA orders and publications may be obtained from National Production Authority, Washington 25, D. C., or from any of its local offices.

Automobile Passenger Tax Meeting.—On April 17 at a meeting of the group the Conservation Task Group's recommendation that the use of nickel be eliminated in intake valves but continued in exhaust valves was reported along with the proposed elimination of nickel plating from bumpers and bumper guards.

Cobalt.—Schedule 2 issued May 7 extends M-80 to include cobalt compounds produced from ores, metal concentrates, and refinery residues, in the definition of cobalt.

Consumer Durable Goods.—The first three groups of materials listed under M-47 B's schedule may be combined into one large group according to the amendment issued April 15. This will permit multi-line manufacturers to gear their production to changing sales trends. Dir. 1, issued April 28, states allotments of controlled materials granted a manufacturer under M-47 B to make a new item may not be used for something else.

Grinding, Polishing and Buffing Machines.—These, as well as other machinery under Exhibit A, are covered by a numerical preference list amending M-41 to govern the priority of delivery to defense contractors dated April 18.

Nickel Anodes.—CPR 138, issued April 21, 1952, establishes ceiling prices for nickel anodes and for the service of converting or manufacturing any such commodity from materials owned by another person.

Rubber.—An Amendment of April 21 provides further easement in the use of natural rubber and continues the prohibition of private importation of natural rubber until June 30, 1952.

Stainless steel, Nickel bearing.—Schedule 3 (Order M-64), of April 3, states the subject material in excess of 500 pounds may not be sold by any steel distributor to a customer unless an AMC order covers the material.

Columbium and Tantalum.—According to Schedule 5 to M-80, users of low carbon (0.03 maximum) austeritic stainless steels or austeritic steels stabilized with columbium, tantalum or titanium are permitted to employ columbium welding rods for welding such steel.

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Polarization

(Continued from page 633)

voltage and in General of Cathodic Polarization", Z. physik. Chem. **A172**, 470–472.—To correct a misstatement in the literature, it was pointed out that more than 10 years ago the author's theory of electromotive equilibrium led to the result that slow discharge of hydrogen-ions accounts for hydrogen overvoltage and that cathodic polarization is caused by delayed discharge of ions.

[48]M. deK. Thompson and C. W. Rice, Jr., "The Hydrogen Overvoltage and the Anodic Behavior of Tungsten in Aqueous Solutions of Potassium Hydroxide", Trans. Electrochem. Soc. **67**, 71–79.—A general investigation.

[49]N. Thon, "Capacity of Polarized Mercury at Very Low Frequencies", Compt. rend. **200**, 54–56.—A general study showing complete independence of the frequency and agreement between the calculations of capacity based on either cathodic or anodic polarization.

[50]P. S. Tutundzhic, "Simultaneous Cathodic and Anodic Polarization of Primary Electrodes. I Primary Electrodes of Platinum, Palladium and Gold", Z. Elektrochem. **41**, 602–611.—A general investigation.

[51]M. Volmer and H. Wick, "Hydrogen Electrodes", Z. physik. Chem. **A172**, 429–447.—Measurements were made to find the cause of the evolution on and solution of hydrogen in platinum, iridium and gold electrodes in highly purified electrolytes. The data indicated agreement with the discharge theory of overvoltage. The anodic curve showed deviation from a simple logarithmic course.

[52]M. I. Zilberfarb and M. A. Rabinovich, "Overvoltage of Metals in Presence of Colloids", Trav. inst. chim. Charkov. **1**, 87-98; Chem. Abs. **32**, 4084 (1938).—The overpotential observed in the electrolysis of 0.1 — *N* or 1.0 — *N* silver nitrate (silver, gold or platinum electrodes) was increased in the presence of colloids (gelatin, dextrin, gum arabic) in the electrolyte. The effect was inversely proportional to the current density.

Analytical Methods for the Determination of Cyanates in Plating Wastes and in Effluents from Treatment Processes

BY B. F. DODGE AND W. ZABBAN

Corrections

The following corrections should be made in the article published in the April, 1952 issue:

1. The equation on p. 382 should read

$$2\,(HgI_2\cdot 2\,KI) + 2\,NH_3 = NH_2Hg_2I_3 + 4\,KI + NH_4I$$

2. The last sentence in the second complete paragraph, middle column, p. 383, should begin: "One part per million, of ammonium sulfate. . . ."

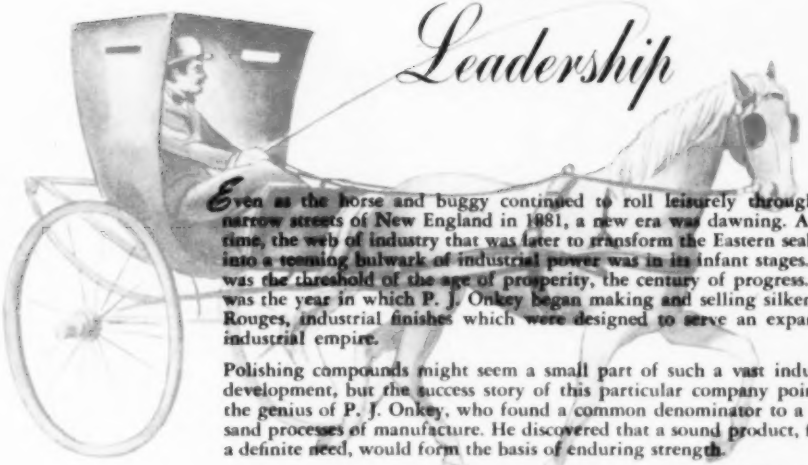
We regret these errors.

Seventy Years

IS A LONG TIME TO MAINTAIN

A POSITION OF

Leadership



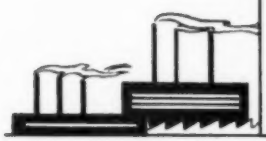
Even as the horse and buggy continued to roll leisurely through the narrow streets of New England in 1881, a new era was dawning. At this time, the web of industry that was later to transform the Eastern seaboard into a teeming bulwark of industrial power was in its infant stages. This was the threshold of the age of prosperity, the century of progress. This was the year in which P. J. Onkey began making and selling silken Red Rouges, industrial finishes which were designed to serve an expanding industrial empire.

Polishing compounds might seem a small part of such a vast industrial development, but the success story of this particular company points to the genius of P. J. Onkey, who found a common denominator to a thousand processes of manufacture. He discovered that a sound product, filling a definite need, would form the basis of enduring strength.

As industry grew and manufacturing facilities developed, Onkey formulated new finishing products to meet new requirements. Joseph J. Onkey joined his father in 1901. Together, they explored new materials, developed new methods and processes. Time and costs were cut and efficiency increased as their expanding business kept pace with the ever-growing strength of industrial America.

In 1932 Theodore F. Onkey joined the firm and later became its general manager. During this period, the Onkey family enlarged their manufacturing plant and explored new markets as nation-wide sales brought volume production to the highest point in the history of the company. This progress continued and in 1939, the business was incorporated as the Roberts Rouge Company, with Theodore Onkey as president. His son, Robert Lee Onkey, became president in 1951.

The Onkey family, pioneers of America's industrial age, developed and guided their business to a position of prominence through seventy years of industrial expansion. The Roberts Rouge Company is known throughout the country today for its fine industrial finishes.



Since 1881, literally billions of products have been finished by materials created by the Onkey family. Today these materials include every practical type of abrasive for every type of finish on metal, plastic or wood. As new problems arise, the Roberts Laboratories are ready to meet them with the accumulated experience of more than seventy years in the field of industrial finishing.

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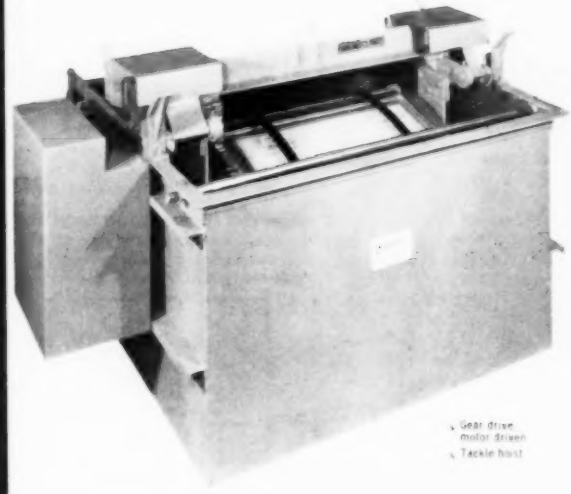

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JUNE 16—19, 1952

CHICAGO, ILLINOIS

CONVENTION HEADQUARTERS
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INDUSTRIAL FINISHING EXPOSITION
INTERNATIONAL AMPHITHEATRE

Program

Dear Guests:

IT IS the hope of the various committees who participated in this Convention that everyone will avail himself of the many opportunities presented here for his pleasure and instruction. To this end a calendar of daily special events has been prepared—and is outlined in the following pages.

If anyone wants company on his daily rounds, the Reception Committee will assist him in looking up an old friend, or meeting a new one—we hope many of both.

The better half (the Ladies' Division) will be making convention history in that their committee has planned new activities, starting with the selection of a queen, and then on to a gala program. (See calendar index.)

Especially do we want everyone, including the women, to attend the Industrial Finishing Exposition because of the new methods, new materials, and new equipment which will be on display. For example, there will be a plating demonstration operated by the Chicago Electro-Platers' Institute which will consist of barrel plating, chromium plating, and two well-known white brass processings. Free take-home samples.

Come look, listen, learn—and have LOTS of fun.

Sincerely yours,

Clyde Kelly

General Chairman
39th Annual Convention Committee

40 Years Young

CHICAGO celebrates its 40th Anniversary by again playing host to another great national convention. All of the committees have worked long and enthusiastically to bring you the most outstanding convention in the history of the Society.

You will find the papers to be presented at the Educational Sessions are timely as well as excellently prepared. The authors are acknowledged authorities in their fields.

The Third Industrial Finishing Exposition will offer the visitor the most complete show of modern equipment, tools and processes for finishing ever assembled under one roof. Truly, the greatest Finishing Show on earth.

Icing for the cake will be found on the social side in settings to be found only in the greatest convention city in the world.

Chicago invites you to help celebrate this memorable occasion.

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President, Chicago Branch
American Electroplaters' Society

Clyde Kelly
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Finance

CONDENSED PROGRAM

Central Daylight Saving Time Used Throughout

In anticipation of those who will arrive in Chicago on Sunday, and, to accommodate local members and wives who may wish to register early, the registration desk will be open from 3:00 p. m. until 8:00 p. m., Sunday, June 15. The Hospitality Committee will be waiting there to greet and assist you.

Though Educational Sessions will be held in the Stock Yards Inn, and the 3rd Industrial Finishing Exposition will be in the International Amphitheatre, General Headquarters for the Convention will be the Conrad Hilton Hotel, 8th and Michigan.

Transportation by buses, at regular intervals, has been arranged. Early each day buses will begin leaving the Conrad Hilton Hotel. They will arrive at the International Amphitheatre and Stock Yards Inn approximately 25 minutes later. There they will unload and take on passengers for the return trip to the hotel. For those who prefer to drive their own cars to the Exposition and Educational Sessions, or wish transportation to other parts of the city, a map of the city marked with convenient routes will be provided in the program book.

The Opening Session and all Social Affairs will be held in the headquarters hotel, the Conrad Hilton. All other meetings, unless otherwise stated, will be held at the Stock Yards Inn.

The registration fee of $15.00 will provide each registrant with a book of tickets to the various technical and social events. A convention office located on the third floor of the Conrad Hilton Hotel will be open from 9:00 a. m. to 5:00 p. m. for the convenience of visitors.

SUNDAY, JUNE 15, 1952

10:00 A. M.

A. E. S. Executive Board Meeting, Conrad Hilton Hotel.

1:00 P. M.

Chicago Electroplaters' Institute Brunch, Conrad Hilton Hotel.

2:00 P. M.

Metal Finishing Suppliers' Association, Inc., Board of Directors' Meeting, Conrad Hilton Hotel.

3:00 P. M.

Registration, Conrad Hilton Hotel, 3rd Floor. $15.00 per person.

MONDAY, JUNE 16, 1952

8:00 A. M.

Registration, Conrad Hilton Hotel, 3rd Floor, until 5:00 P. M.

10:00 A. M.

Opening Session, Conrad Hilton Hotel, Grand Ballroom.

11:00 A. M.

Business Meeting, Conrad Hilton Hotel, Grand Ballroom.

12:00 Noon

Exposition Opens, International Amphitheatre. Hours 12:00 to 8:00 P. M.

Metal Finishing Suppliers' Association, Inc., Luncheon, Conrad Hilton Hotel.

12:30 P. M.

Speakers' Luncheon, Stock Yard Inn, Little Gallery.

2:00 P. M.

First Educational Session, Stock Yard Inn.

Section A
First Floor Ballroom

Section B
Saddle and Sirloin Club Ballroom

3:45 P. M.

Style Show and Tea, Marshall Field & Company.

8:30 P. M.

International Fellowship Club Open House, Grand Ballroom, Conrad Hilton Hotel.
Auspices of the Metal Finishing Suppliers' Association, Inc.
A night of informal gaiety and good fellowship.
Refreshments—Music—Dancing.
Buffet served at 10:00 P. M.
Crowning of the Convention Queen, by A. P. Munning, President of A. E. S. A.

TUESDAY, JUNE 17, 1952

7:45 A. M.

Secretaries' Breakfast, Lipton Room, Stock Yards Inn.
Fund Raisers' Breakfast, Founders Hall, Stock Yard Inn.

8:00 A. M.

Speakers' Breakfast, Little Gallery, Stock Yard Inn.

9:00 A. M.

Third Industrial Finishing Exposition, International Amphitheatre, open until 5:00 P. M.
Registration, 3rd Floor, Conrad Hilton Hotel, until 12:00 Noon. Exchange banquet ticket for reservation.
International Fellowship Club Annual Golf Tournament, Nordic Hills C. C., Itasca, Ill. Courtesy of Metal Finishing Suppliers' Association, Inc. See Bulletin Board.
Second Educational Session, Stock Yard Inn.

Section A
First Floor Ballroom

Section B
Saddle and Sirloin Club Ballroom

11:45 A. M.

Aunt Ella Society Garden Party Luncheon, McKinlock Gardens, Art Institute.

12:30 P. M.

National Association of Metal Finishers, Inc., Luncheon, Saddle and Sirloin Club.

2:30 P. M.

Art Institute Visit, Fullerton Hall, Art Institute of Chicago.
Evening Free.

WEDNESDAY, JUNE 18, 1952

8:00 A. M.

Speakers' Breakfast, Stock Yard Inn, Little Gallery.
Registration until 12:00 Noon.
Banquet ticket should be exchanged for reservation.

9:00 A. M.

Third Educational Session, Stock Yard Inn, First Floor Ballroom.

10:00 A. M.

Ladies' Plato Party, Conrad Hilton Hotel, Grand Ballroom.

12:00 Noon

Exposition open until 10:00 P. M.

12:30 P. M.

Ladies' Luncheon, Conrad Hilton Hotel, Boulevard Room.

4:00 P. M.

Ball Game, East vs. West, Grant Park.

THURSDAY, JUNE 19, 1952

7:45 A. M.

Research Breakfast, Stock Yard Inn, Lipton Room.

9:00 A. M.

Exposition open until 5:00 P. M.
Research Educational Session, Stock Yard Inn, First Floor Ballroom.

11:00 A. M.

Ladies' Educational Session and Luncheon, Stock Yard Inn, Saddle and Sirloin Club.

2:00 P. M.

Final Business Session American Electroplaters' Society, Conrad Hilton Hotel North Ballroom.

7:00 P. M.

Annual Banquet, Conrad Hilton Hotel, Grand Ballroom.

Your registration book must be exchanged for a reservation ticket for dinner. At the completion of serving dinner the tables will be removed from the floor and the chairs are to be set up for the entertainment on the stage at the east end of the Grand Ballroom.

Toastmaster: Clyde Kelly.

Awarding of prizes and introductions, followed by dancing.

Program of Sessions

MONDAY, JUNE 16, 1952

8:00 A. M. to 5:00 P. M.

Registration, 3rd Floor, Conrad Hilton Hotel.

10:00 A. M.

Opening Session, Conrad Hilton Hotel, Grand Ballroom. Open to both the men and their ladies.

10:01 A. M.

Invocation by the Reverend Frank Mesle, Oneida, N. Y.

10:05 A. M.

Greetings from the Chicago Branch by Raymond F. Ledford.

10:08 A. M.

Industrial Finishing Exhibition by Herberth Head.

10:11 A. M.

Introduction of Officers by Clyde Kelly.

10:15 A. M.

Keynote Address: "The Need for Stabilization in the Defense Economy", by Mr. Michael DiSalle, Toledo, Ohio.

10:45 A. M.

Drawing: For the Queen of the Convention and her two attendants.

11:00 A. M.

Business Meeting of the Supreme Society and Presentation of First Carl E. Huessner Award, Grand Ballroom.

Delegates will register at door before entering session to eliminate roll call.

This meeting will be conducted on scheduled time to permit the luncheon hour and transportation time to the Stock Yards Inn for the afternoon educational sessions, which in turn must be scheduled accurately in separate rooms. The time element will be an important factor in all meetings. Please cooperate.

2:00 P. M.

First Educational Session, Stock Yard Inn.

Dual Sessions

Time schedule shown will be maintained.

Section A

First Floor Ballroom.

Chairman: R. Wysong, Studebaker Corporation, South Bend.

"Improved Plating and Anodizing with Decahydrated Chromic Acid Solutions", by Lloyd Gilbert, Rock Island Arsenal, Rock Island; Floyd Kahler and W. S. Morrison, Illinois Water Treatment Company, Rockford.

2:40 P. M.

"Engineering Aspects of Waste Prevention", by D. Milne, General Motors Corporation, Detroit.

3:20 P. M.

"Filtration—Theoretical and Practical", by Harold W. Faint, Industrial Filter & Pump Manufacturing Company, Chicago, and R. Scott Modjeska, Scientific Control Laboratories, Chicago.

2:00 P. M.

Section B

Saddle and Sirloin Club Ballroom.

Chairman: Vincent Mattacotti, Milwaukee Plating Company, Milwaukee.

"Some Experiences in Heavy Rhodium Plating", by H. J. Wiesner, Bendix Aviation Corporation, South Bend.

2:40 P. M.

Film: *"A Visit to the Electroplating Projects Laboratories of Westinghouse"*, by G. W. Jernstedt, Westinghouse Electric Corporation, East Pittsburgh.

3:20 P. M.

"An Explanation of Black Nickel Plating", by Walter R. Meyer, Enthone, Inc., New Haven; Earl J. Serfass and Ralph Muraca, Lehigh University, Bethlehem.

TUESDAY, JUNE 17, 1952

9:00 A. M.

Second Educational Session, Stock Yard Inn.

Dual Session

Section A

First Floor Ballroom.

Chairman: Frank L. Clifton, General Motors Research Laboratories, Detroit.

"Plastics as Plating Room Engineering Materials", by D. Gardner Foulke, American Electroplaters' Society, Newark.

9:40 A. M.

"Materials of Construction for Plating Rooms", by Russel Harr, Western Electric Company, Chicago.

10:20 A. M.

"Materials of Construction for a Waste Water Treatment System", by Fred Brune, Chrysler Corporation, Detroit.

9:00 A. M.

Section B

Saddle and Sirloin Club Ballroom.

Chairman: M. M. Beckwith, Harshaw Chemical Company, Cleveland.

"Vacuum Metallizing Today", by J. Gordon Seiter, F. J. Stokes Machine Company, Philadelphia.

9:40 A. M.

"Current Distribution in Barrel Plating—A Statistical Study", by William Greissman and Robert Carlson, National Lock Company, Rockford.

10:20 A. M.

"White Brass Plating", by R. B. Saltonstall, The Udylite Corporation, Detroit.

WEDNESDAY, JUNE 18, 1952

9:00 A. M.

Third Educational Session, Stock Yard Inn, First Floor Ballroom.

Chairman: R. E. Pettit, Thrift Etching Corporation, Chicago.

"A Critical Review of Substitute Finishes", by Myron Ceresa, Westinghouse Electric Corporation, East Pittsburgh.

9:40 A. M.

"Hard Coatings on Aluminum", by F. Keller, Aluminum Corporation of America, New Kensington.

10:20 A. M.

"Instrumentation in the Plating Room", by Frank Savage, Graham, Crowley and Associates, Chicago.

THURSDAY, JUNE 19, 1952

9:00 A. M.

Research Educational Session, Stock Yard Inn, First Floor Ballroom.

Chairman: Walter L. Pinner, Hendaille-Hershey Corporation, Detroit.

"Benefits to the Plater of the A. E. S. Research Program", by Earl J. Serfass, Lehigh University, Bethlehem.

9:40 A. M.

"Practical Aspects of the Atomizer Test", by Henry B. Linford, Columbia University, New York.

10:20 A. M.

"Engineering and Economic Aspects of the Treatment of Cyanide Wastes", by Barnett F. Dodge, Yale University, New Haven.

2:00 P. M.

Final Business Session, Conrad Hilton Hotel, North Ballroom.

Presiding Officer: Cleveland F. Nixon.

Usual Order of Business.

A Lady Quotes . . .

WIVES enjoy going to clubs, especially if the latter are men's organizations. They like to invade man's domain. Husbands and wives should purposely cultivate the habit of sharing their recreation together. That is a mark of true emotional adulthood".

This year the women will take a prominent part in the opening session of the A.E.S. Convention, for here they will choose the QUEEN of the Convention. Many exciting and attractive ideas (perhaps for future reference) will spring up around the selection and entertainment of their Queen. Will you be present? Are you over 16 years of age? Then the Lucky Lady may be you!!

Ladies' Headquarters will be the North Assembly Room, on the third floor of the Conrad Hilton Hotel. During your leisure hours use it as a meeting place, or use it to relax in comfort, play cards or visit with your friends. Use it as informally as you wish. Information, messages and notices will be posted on a convenient bulletin board. At all times one of the ladies' committee will be there to assist you with arrangements for the various broadcasts, ball games, beaches, boats, breakfasts, bonnets, barbecues, bars, beverages, bargains, etc., that have been requested.

Arrangements have been made for the ladies to be taken care of at all times when their husbands are busy with necessary convention affairs.

A very warm and courteous invitation is extended to you by the Ladies' Committee.

Mrs. Marion Longfield

Chairman

Left to Right, Standing: Miss Irene Donnelly, Miss Mary Loftus, Mrs. Harold Faist, Mrs. Marion Longfield, Mrs. Orville Kocour, Mrs. Paul Glab. Seated: Mrs. Elmer Olson, Mrs. Edward Stanek, Mrs. Edward Stack, Mrs. Raymond Ledford, Mrs. Cyril Kocour. On the Committee, but not shown, Mrs. Harold Wiesner

MRS. WYSONG

MRS. GEISSMAN

Ladies' Program

HEADQUARTERS—North Assembly Room, Conrad Hilton Hotel, Third Floor

SUNDAY, JUNE 15, 1952

3:00 P. M.

Registration, Conrad Hilton Hotel, Third Floor.

MONDAY, JULY 16, 1952

8:00 A. M.

Registration, Conrad Hilton Hotel, Third Floor.

10:00 A. M.

Opening Session, Conrad Hilton Hotel, Grand Ballroom.

Ladies will join the men. Before the close a drawing for the Queen of the Convention will be held. Three tickets will be drawn, the first for the Queen, and the following two for her attendants. These ladies must be present at time of drawing and must be over 16 years of age.

3:10 P. M.

Transportation to Marshall Field & Company, 8th Street Entrance, Conrad Hilton Hotel.

3:45 P. M.

Tea and Style Show conducted by Field's Eminent Stylist, Marshall Field & Company, Narcissus Room.

Hostesses: Mrs. Raymond Ledford, Mrs. Harold Faint, Mrs. E. F. Stack, Mrs. William Grissman.

8:30 P. M.

International Fellowship Club Open House Party, Conrad Hilton Hotel, Grand Ballroom. Auspices of Metal Finishing Suppliers' Association, Inc. Music, dancing, buffet supper. Crowning of the Convention Queen by Mr. A. P. Munning.

TUESDAY, JUNE 17, 1952

11:45 A. M.

Aunt Ella Society Garden Party Luncheon, Art Institute of Chicago, McKinlock Gardens.
Auspices of Oakite Products, Inc.
Host: David N. Clarin (Aunt Ella).

2:30 P. M.

Talk on Exhibits of China, Paintings, and Other Art Objects, Art Institute of Chicago, Fullerton Hall.
Hostesses: Mrs. Raymond Ledford, Mrs. Paul Glab, Mrs. Elmer Olson, Mrs. Ralph Wysong.

Following the talk the ladies are free to roam the galleries.

Please remind your friends and husband to make Banquet Table Reservations.

WEDNESDAY, JUNE 18, 1952

10:00 A. M.

Plato Party, Conrad Hilton Hotel, Grand Ballroom. Prizes and lots of fun.

Hostess: Mrs. Joan T. Wiarda.

12:30 P. M.

Luncheon in the famous Boulevard Room, Conrad Hilton Hotel.

2:00 P. M.

Monologue by Sulie Harand, well known impressionist.
Hostesses: Mrs. Orville Koecour, Mrs. Cyril Koecour, Mrs. Harold J. Wiesner, Mrs. Edward Stanek, Mrs. Edward F. Stack.

THURSDAY, JUNE 19, 1952

9:30 A. M.

Transportation to Exposition, Educational Session and Luncheon, 8th Street Entrance, Conrad Hilton Hotel.

10:00 A. M.

Visit Third Industrial Finishing Exposition, International Amphitheatre.

11:00 A. M.

Educational Session and Luncheon, Stock Yard Inn, Saddle and Sirloin Club Room.

"How Detergents Take the Rubbing out of Scrubbing". Mr. Gerald A. Lux, of Oakite Products, Inc., will present a nontechnical, informal talk on the various types of detergents, illustrating the more technical points with a few demonstrations.
Hostesses: Mrs. Paul Glab, Miss Mary Loftus, Mrs. Elmer Olson, Mrs. Edward Stanek, Mrs. Ralph Wysong, Miss Irene Donnelly.
Closing of the Ladies' Program.
Good-bye to the Queen. Hello to Mrs. Mary E. Robson, Chairman of the Ladies' Committee for the 1953 Convention to be held in Philadelphia.

7:00 P. M.

Annual Banquet and Ball, Conrad Hilton Hotel, Grand Ballroom.

A night of fun, good food and fine entertainment. Drawing for prizes.

Farewell, good friends, both old and new,
We've been so glad to welcome you.
So sorry now to say good-bye,
But, we'll see you in Philly by and by.

ABSTRACTS OF CONVENTION PAPERS

IMPROVED PLATING AND ANODIZING WITH DECATIONIZED CHROMIC ACID SOLUTIONS, *by Floyd Kahler, Lloyd Gilbert and W. S. Morrison*

The paper discusses the use of the cationic ion-exchange method of removing contaminating metal ions from hard chromium plating and anodizing solutions. Operating data obtained at Rock Island Arsenal are presented and the advantages gained in the plating and anodizing processes are reported.

ENGINEERING ASPECTS OF WASTE PREVENTION, *by David Milne*

This paper outlines the trend from overall treatment of waste liquids to recovery and concentration of the metals and materials formerly wasted. The change in thinking on industrial waste control is emphasized and the practices and equipment developed to prevent waste of expensive solutions and eliminate or minimize waste treatment facilities is outlined. Examples are drawn from operating installations and present figures are presented showing the actual savings experienced.

FILTRATION—THEORETICAL AND PRACTICAL, *by Harold Faint and R. Scott Modjeska*

The first portion of this paper deals with the theoretical concepts of filtration, filter designs, filtration media, caking materials, and nature of extractables. This is followed by a discussion of materials of construction for specific applications which then leads to the practical use of specific types of filters for specific problems and trouble shooting in filtration systems.

SOME EXPERIENCES IN HEAVY RHODIUM PLATING, *by Harold J. Wiesner*

A short review of previous work on rhodium plating is given as well as the properties of rhodium. Studies of the effects of metal concentration, temperature, acidity, current density upon rate of deposition of two types of rhodium baths are presented. Effects of impurities and methods of purification are outlined. Methods of control of the bath constituents are discussed. Experience in operating rhodium baths over several months' time on a semi-production basis are related.

R. WYSONG
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L. GILBERT
W. S. MORRISON
D. MILNE

H. FAINT
R. S. MODJESKA
V. MATTICOTTI
Session Chairman
H. J. WIESNER
G. W. JERNSTEDT

ABSTRACTS OF CONVENTION PAPERS

A Visit to the Electroplating Projects Laboratories of Westinghouse, *dialogue and photography, by George W. Jernstedt*

This is a colored film with sound accompaniment on magnetic tape showing the type of construction of these laboratories, the various tank arrangements, and examples of the plating research carried out along with the facilities available.

An Explanation of Black Nickel Plating, *by Earl J. Serfass, Ralph F. Maraden and Walter R. Meyer*

An explanation of the mechanism of black nickel electroplating is presented as well as of immersion blackening of zinc, iron and other metals in solutions containing thiocyanate and thiosulfate. Thermodynamic calculations are given to indicate that thiocyanate and thiosulfate ions are reduced to sulfide ions either electrically or by metal dissolution. The mechanism of the reaction and the reason for the use of zinc ions and ammonia are discussed.

Plastics as Plating Room Engineering Materials, *by D. Gardner Foulke*

The use of plastics in the plating room is discussed, with particular reference to new applications, and materials. The limitations of certain types of plastics and the precautions which should be taken with respect to their use are reviewed. Examples of the newer developments in this field will be shown.

Materials of Construction for Plating Rooms, *by Russel Harr*

The materials of construction used for the floors and the drainage system are discussed. In the latter case the system is divided to provide for the segregation and batch treatment of water containing cyanides and water containing acid and alkali. Piping systems employed for the transfer of large amounts of acid, liquid caustic and de-ionized water are described. Exhaust duct construction is explained along with the steps taken to protect ducts and fans from corrosion. Tank materials are discussed.

E. J. Serfass
R. F. Muraca
W. R. Meyer
F. Clifton
Session Chairman
D. G. Foulke

R. Harr
F. Brune
M. M. Beckwith
Session Chairman
J. G. Seiter
W. Getsman

ABSTRACTS OF CONVENTION PAPERS

MATERIALS OF CONSTRUCTION FOR WASTE WATER TREATMENT SYSTEM, *by Fred J. Brune*

The materials used in the construction of a plating waste water treatment system are described and the reason for the selection in each case is given. An evaluation of the materials after two years' operation is presented. The discussion covers sewer lines to the receiving sumps, transfer to reaction tanks and thence to secondary treatment and classification unit and finally to the point of discharge in a public stream.

VACUUM METALLIZING TODAY, *by J. Gordon Seiler*

The process of vacuum metallizing is defined and the applications for which the technique is useful are described. The metals that can be deposited by this method and the materials that can be coated are considered. A description of the operating procedures required, including *pre-* and *post*-treatments is presented.

CURRENT DISTRIBUTION IN BARREL PLATING—A STATISTICAL STUDY, *by William Greissman and Robert Carlson*

This paper is a progress report on a study being made of the variance of deposit thickness encountered in a given load coming from a plating barrel. Statistical methods are applied to the measurements obtained for each load and the principles involved in statistical methods are discussed.

WHITE BRASS PLATING, *by R. B. Saltonstall*

The author first presents a brief historical background of white brass plating, then discusses solution composition, operating data, equipment requirements, and the effect of variables on the composition of the alloy deposit. Characteristics of the deposit, solution control, preliminary coatings, available corrosion data and uses are also discussed.

R. B. SALTONSTALL
R. PETTIT
Session Chairman
M. CERESA
F. KELLER

F. SAVAGE
W. L. PINNER
Session Chairman
H. B. LINFORD
F. KELLER

ABSTRACTS OF CONVENTION PAPERS

A Critical Review of Substitute Finishes, *by Myron Cere*

A critical review is presented of the metallic finishes available during the present period of shortages. The difficulties that have been encountered with substitute finishes are discussed and examples are given of items plated with such finishes. Base metal preparation, plate thickness and post-treatment of the plated surface are discussed. Solutions to some of the production problems arising from finish changes are reviewed.

Hard Coating on Aluminum, *by F. Keller*

The characteristics of newly developed hard coatings on aluminum are presented. The mechanism by which these coatings are formed on different alloys and the relationship between thickness and the hardness of the coatings are discussed. The processes in present use are described.

Special Instrumentation in the Plating Room, *by Frank Savage*

The details of automatic *p*H control and electronic devices for the control of solution level are described. The use of conductivity measuring instruments to indicate boiler feed-water contamination is discussed as well as unusual instrument uses for ordinary plating operations.

The Benefits to the Plater of the A. E. S. Research Program, *by Earl J. Serfass*

The summary of the progress and accomplishments of the A. E. S. Research Committee during the past year is presented. Practical developments of use to the average plater are stressed.

Practical Aspects of the Atomizer Test, *by Henry B. Linford*

The atomizer test, a new degreasing evaluation method developed in A. E. S. Research Project No. 12, is discussed from the standpoint of plating shop usefulness. Practical applications of the atomizer test which are discussed include: First, the test may be used to check the effectiveness of an operating cleaner on a control basis; second, the test is useful as a check in new cleaner formulations in comparison with those being used in the shop; third, the atomizer test provides a means of evaluating the removal of new oils, the use of which may be contemplated prior to the finishing operation.

Engineering and Economic Aspects of the Treatment of Cyanide Waste, *by Burnett F. Dodge*

The various processes studied by A. E. S. Project No. 10 are reviewed and practical data on cost, equipment, and operating hints are presented with regard to the treatment of cyanide wastes.

Plated Ware Exhibits

International Amphitheatre

AT YOUR Convention this year, exhibits of Plated Ware submitted by Branches and Individual Members of the A.E.S. are being displayed in 14 booths at the Industrial Finishing Exposition. These are the only exhibits to be shown at this 37th Convention.

In addition to the competition between the Branches for the honor of having a prize-winning display, opportunity is also being given to the Individual Members to present exhibits for other prizes. An impartial committee composed of representatives from three different Branches will have the unenviable task of selecting the three best Branch Exhibits and the best Individual Member Exhibit.

A visit to the Plated Ware Exhibits will be worth while for everyone in attendance and will be a tribute to those Branches and Individual Members cooperating in the Exhibit.

Harry Hanson

Chairman

Branch Exhibits Committee

Plant Visitations

NEGOTIATIONS have been under way for visiting some of our Nation's finest plating departments of manufacturers and job shops.

Complete details for these trips will be available for you throughout the Convention Week at the Registration Desk on the third floor of the Conrad Hilton Hotel.

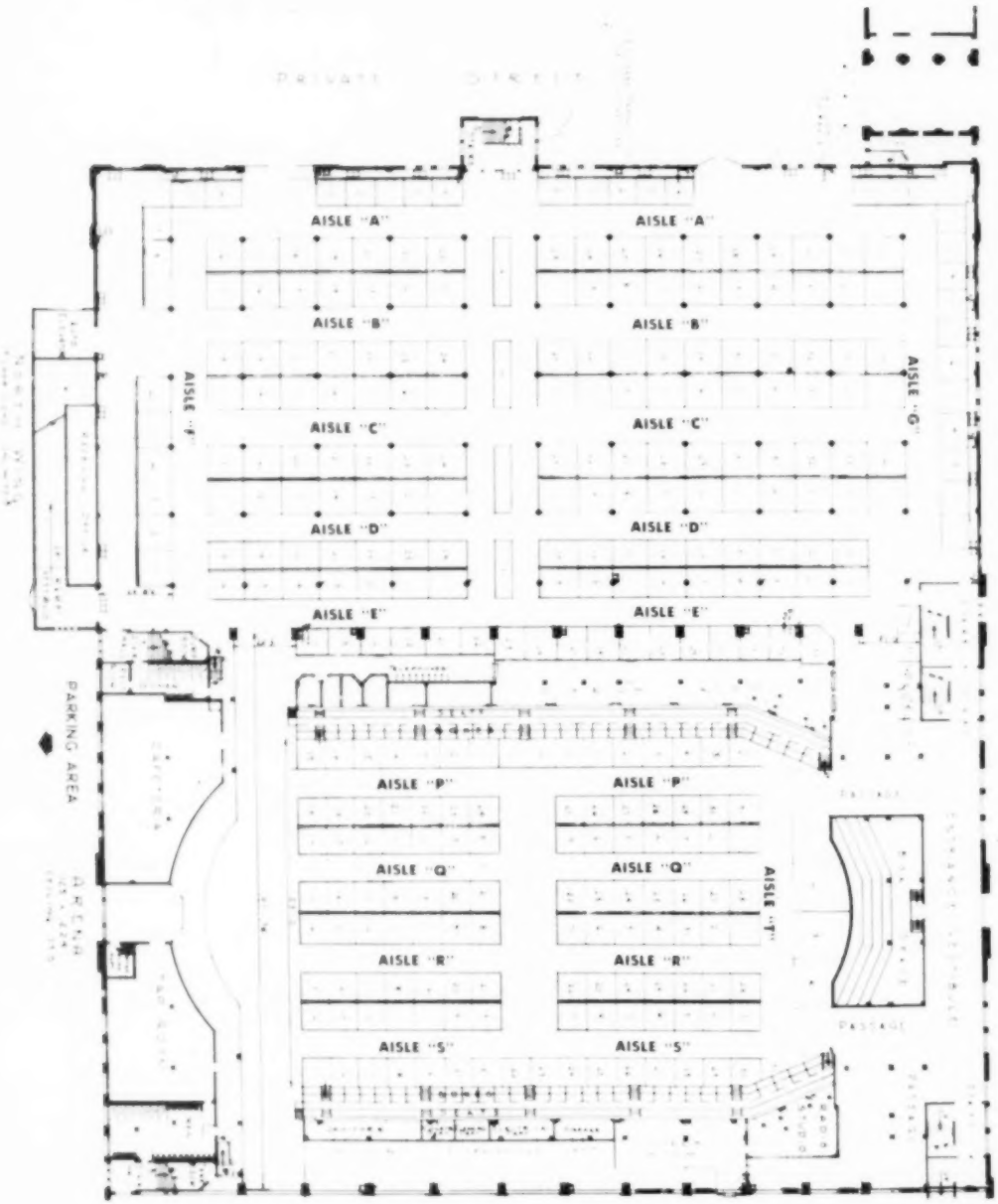
You are invited to check on the availability, schedules, and transportation upon your arrival.

W. O. Jinn

Chairman

Plant Visitations Committee

Floor Plan—International Amphitheatre



VISIT THE 3RD INDUSTRIAL FINISHING EXPOSITION INTERNATIONAL AMPHITHEATRE, CHICAGO, ILL.

THE Industrial Finishing Exposition of 1952 is displaying to Exposition attendees the greatest array of finishing services and products ever assembled under one roof.

Out at Chicago's International Amphitheatre more than 100 new products will make their first public appearance. Equipment valued at approximately $2,500,000 will be on display.

One of the highlights of this year's Exposition is the inclusion of the many educational exhibits. Several representative groups are providing exhibits explaining the many important phases of the industrial finishing field.

The Chicago Electro-Platers Institute, an association of custom plating establishments, is showing various types of plating on metal objects. Samples of this work are being given to Exposition attendees as educational souvenirs. Contrasting operations found in normal plating room practices will be shown at the CEPI exhibit. Automatic handling of decorative coating is being shown in a complete plating room line, while another line is demonstrating the operation of a protective plating line. Panel displays showing a variety of finishes completes the exhibit.

Technical personnel of CEPI member firms are manning the Exhibit, and are to provide answers to technical questions from visitors.

The A. E. S. Research Committee is featuring an exhibit showing the technical projects that the Society has undertaken and is currently working upon in American universities and industrial plants. The A.E.S. has attracted widespread acclaim for its research activities which are attempting to solve many of industry's most difficult problems.

Members of the A.E.S. Research Committee will be in attendance to answer questions and to explain procedures used in the projects.

Although the Society is holding its 39th Annual Convention at the Conrad Hilton Hotel, the technical sessions are being held at the famed Stock Yard Inn, adjacent to the Amphitheatre.

To bring to Chicago's attention the importance of the Industrial Finishing Exposition and the A.E.S. 39th Annual Convention, Mayor Martin H. Kennelly has proclaimed the week of June 15 to 21 as "INDUSTRIAL FINISHING WEEK IN CHICAGO" and has urged that all industrial firms as well as all of Chicago's citizens take advantage of the educational benefits to be found at the twin events.

Industrial Finishing Exposition—List of Exhibitors

Acme Manufacturing Company, 1400 E. Nine Mile Rd., Detroit 20, Mich. Booths D—11, 12, 13.

Personnel Attending: G. B. Carlson, Vice-President; G. A. Carson, A. Leavy, R. Wesley.

Products Exhibited: Acme 66" Combination seven-station indexing and 24 spindle continuous Rotary Automatic Polishing and Buffing Machine; automatic and semi-automatic polishing and buffing machinery.

Admiral Engineering Corporation, 900 W. Erie St., Chicago, Ill. Booth A—7.

Agri-Indus Manufacturing Company, 1327 Huntington Bank Bldg., Columbus 15, Ohio. Booth G—7.

Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore, Md. Booths S—19, 20.

Industrial Finishing Exhibition in Lights

Everyone dreams of having their name up in lights.

For the Industrial Finishing Exposition of 1952, that dream has come true.

The world's tallest electric sign will carry the Exposition message to millions of Chicagoans and their guests during show time. The great sign stands 24 stories high. It has 43.7 miles of electric wiring, 6,144 electric lights and the message it carries stands 13 feet high.

The giant Pabst Blue Ribbon sign, located high above famous Michigan Avenue, will carry this message: "Attend Industrial Finishing Exposition — June 16 to 20 — International Amphitheatre".

If any of the Exposition exhibitors falls in love with the sign or message and wants to take it home with him, he'll have a hard time doing so.

The sign weighs 70 tons!

American Buff Company, 2411 S. La Salle St., Chicago 16, Ill. Booths O—15, 16, 17.

Personnel Attending: B. P. Sax, President; S. P. Sax, Vice-President; H. Pink, E. W. Hoyle, L. B. Sax, M. Rudem, E. Reichenberg.

Products Exhibited: Automatic Centerless Bias Buffs; Pre-Assembly for Automatic Centerless Buff, all types of buffs and polishing wheels.

American Electroplaters' Society Research Program, Booths F—4, 5, 6.

American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. Booth A—22.

Personnel Attending: A. F. Ford, Taylor Lyman, Ralph H. Cromwell.

Products Exhibited: Metal Progress Magazine, Material on National Metal Exposition.

Americana Corporation, 333 N. Michigan Ave., Chicago, Ill. Booth P—13.

Personnel Attending: L. Eastman, A. Eastman.

Products Exhibited: Encyclopedia Americana, Book of Knowledge.

Ashdee Products, Inc., 18029 Dixie Highway, Homewood, Ill. Booths S-2, 3, 4.

Personnel Attending: A. C. Wallberg, President; J. Rapes, Vice-President; J. T. O'Connor, Treasurer; R. A. Wallberg, Secretary; W. Linklater, E. Kennedy, C. Wright, C. J. Evely, J. J. Kasper, B. Knoff, W. Okew, M. Peterson, W. Marbach, W. Nyren, B. O'Connor, P. Lang, D. Skidmore, R. Dalton, J. Condron, W. Bielefeldt, P. Meccezzi, B. H. Vlier, R. E. O'Brien, C. Sciortino.

Products Exhibited: High voltage equipment used for automatic electronic spray painting.

Automotive Rubber Company, Inc., 8601 Epworth Blvd., Detroit 4, Mich. Booths C—9, 10.

Personnel Attending: R. L. Redmond, Vice-President; W. C. Enright, C. Olsen, R. H. Glezen, G. C. Ludwig.

Products Exhibited: Rubber Lined Plating Tanks and Components; Rubber Lined Diaphragm Plating Systems and Components; pipe and fittings.

Bart-Messing Corporation, 229 Main St., Belleville, N. J. Booths S—30, 31.

Personnel Attending: S. G. Bart, Secretary; M. M. Messing, President; E. R. Redlhammer, Vice-President; R. L. Ruloff, Western Sales Manager.

Products Exhibited: Water cooled "reactronically" controlled Sel-Rex Selenium Rectifiers; Standard line of Sel-Rex Selenium Rectifiers.

Beacon Supply Company, 110 Marginal St., Chelsea, Mass. Booth E—2.

Personnel Attending: M. L. Feinberg, President; A. N. Farnham, Vice-President; L. A. Tanner, Sales Manager; R. S. Deacon, Vice-President; J. P. Nix, J. A. Turk.

Products Exhibited: Beaco Bias Buffs; Bay Compounds; Complete Line of Buffing Wheels and Buffing Compounds.

Belke Manufacturing Company, 947 N. Cicero Ave., Chicago 51, Ill. Booths R—15, 16, 17, 18.

G. S. Blakeslee & Company, 1844 S. 52nd Ave., Chicago 50, Ill. Booths S—17, 18.

Personnel Attending: M. B. Pickett, H. N. Arnold, R. A. Kully, J. Pokorny, A. L. Bashe, G. W. Anderson, A. S. Reichel, N. Happ, W. F. Goodwin, J. Bunch.

Products Exhibited: Special Large Liquid-Vapor Degreasing Machine.

Wesley S. Block & Company, 39-15 Main St., Flushing, N. Y. Booths E—32, 33.

Personnel Attending: W. S. Block, President; H. Walker, Dr., General Manager; C. F. Norcross, C. E. Bringham, K. Wells, W. Van Dongen, V. Allen.

Products Exhibited: Heat exchanger of rectifier which permits operation of selenium stacks at high ambient temperatures and under abnormally heavy loads and in corrosive atmospheres; equipment for extremely accurate control of voltages and currents.

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Liquimatic®

THE LEADER IN LIQUID BUFFING COMPOUNDS

- UNSURPASSED STABILITY
- EXCEPTIONAL CLEANING EASE
- SENSATIONAL BUFF SAVINGS
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Liquid compounds available for *all* types of metals

You can use other compounds . . . employ other types of application methods . . . but with NO OTHER compound or equipment can you get so much production with such fine precision and remarkable economy as with LIQUIMATIC.

Remember the name, MILLER LIQUIMATIC —the heart of your entire finishing operation. Liquimatic is available in various grades to meet all requirements and conditions of any job, on all types of metals including nickel.

Decide right now to visit our working display at the show. See for yourself what production and savings Liquimatic can offer you. Ask the operator to stop the wheel. Examine it. See what we mean when we say "LIQUIMATIC — THE ACCEPTED LEADER IN LIQUID COMPOUNDS AND AUTOMATIC APPLICATION EQUIPMENT."

L. F. PHILLIPS

R. I. SLATER

W. L. MORGAN

VISIT
OUR
BOOTHS
P-14
P-15
AT THE
A.E.S. SHOW

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OVER 75 YEARS EXPERIENCE AT YOUR SERVICE!

Drop in at our working display and watch Liquimatic in action. Meet our friendly representatives—talk over your problems. We challenge you to ask any question pertaining to finishing that these men can't answer.

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MILLER COMPOUNDS — HELPING TO MAKE YOUR WORLD BRIGHTER

Exhibitors

W. H. Brady Company, 204 W. Washington, Milwaukee, Wis. Booth E—34.

Personnel Attending: W. H. Brady, President; G. P. Burns.

Products Exhibited: Brady Quik Marks; Brady Safety Signs; Brady Pipe Markers; Stencils; Gaskets.

Branch Exhibits, American Electroplaters' Society, Booths A—9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22.

The Buckeye Products Company, 7020-34 Vine St., Cincinnati, Ohio. Booth B—7.

Personnel Attending: C. Wise, Secretary; A. Hoffheimer, Jr., Vice-President; L. S. Fisher, E. G. Goss.

Products Exhibited: Speedie Buffing and Polishing Compositions, bar and liquid forms.

Buckingham Products Company, 14100 Fullerton Ave., Detroit, Mich. Booths G—1, 2.

Personnel Attending: B. M. Buckingham, President; H. J. Patterson, J. R. Valrance, J. B. Lyon, R. O. Blackford, L. M. Bing, H. E. Gray, W. S. Gray.

Products Exhibited: Polishing and Buffing Compositions.

The Chemical Corporation, 54 Waltham Ave., Springfield, Mass. Booth B—14.

Personnel Attending: K. P. Bellinger, Vice-President; B. H. Gardner, Vice-President; J. C. Kosmos, J. Manz.

Products Exhibited: Pla-Tank, Resin-Bonded Fiberglas tanks, vent hoods, ducts, pipe, crocks, plating barrels, dip baskets; Luster-On, the bright dip for zinc plate; Khaki Drab passivating dips.

Chicago Electro-Platers Institute, Booths A—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.

Products Exhibited: Ten complete plating lines in operation, one decorative, one protective; various articles showing a variety of plating finishes.

Chicago Thrift-Etching Corporation, 1753 N. Sheffield Ave., Chicago 22, Ill. Booths S—21, 22.

Personnel Attending: E. F. Lamm, Vice-President; W. A. Schaudinn, Vice-President; L. D. Camp, J. C. Bodman, G. M. Ross, R. C. Anderson, J. W. Sanders, J. D. McMahan, R. A. Beadle, C. J. Russell, J. E. McCarty, B. M. Halvorson, H. G. Weller, R. B. Jaeger, A. S. Clausen, J. R. Alexander, W. E. Langrill, R. E. Pettit.

Products Exhibited: Finishes, Brite Dip, Scales Panels.

Commercial Filters Corporation, 18 W. Third St., Boston 27, Mass. Booth D—10.

Personnel Attending: R. L. Fielding, Vice-President; J. R. Chisholm, F. P. Beardsley, P. R. Mattravers.

Products Exhibited: Portable stainless steel Fulflo Filter; Honeycomb Filter Tubes; Fulflo Filters.

Conforming Matrix Corporation, Toledo Factories Bldg., Toledo, Ohio. Booths S—11, 12.

Personnel Attending: A. J. Spelker, President; H. E. MacArthur, Vice-President; Mrs. E. M. MacArthur, Secretary; M. T. Schimmel, E. L. Faber, B. Sallhoff.

Products Exhibited: Mask Washing Machine; spray painting masks; spray painting machine.

Creative Development & Manufacturing Company, 2222 E. First St., Dayton 3, Ohio. Booth C—23.

Personnel Attending: B. K. Shonneger, President; E. E. Schafer.

Products Exhibited: Creative's Air-Flow Exhaust Hood.

Crown Rheostat & Supply Company, 3465 N. Kimball Ave., Chicago 18, Ill. Booths R—2, 3, 4, 5.

Personnel Attending: G. E. Huenerfauth, President; J. G. Atherson, Executive Vice-President; F. Green, Vice-President; C. E. Clindinin, J. Runtz, W. Meggers, J. Pauga, W. Swenson, R. Walworth, D. Kraft, R. O'Neil, D. Alesanti, M. J. Hepburn.

Products Exhibited: Plating Rheostats; Rectifiers; Plating Barrels; Centrifugal Dryers; Tumble Finishing Equipment.

De Mott Industries, 216 N. Jefferson St., Chicago, Ill. Booth A—8.

Personnel Attending: T. W. De Mott.

Products Exhibited: Testing Equipment.

Detrex Corporation, Box 501, Detroit 32, Mich. Booth S—1.

Personnel Attending: W. F. Newbery, L. Camel, W. H. Webb, E. H. Ehlert, G. W. Walter, W. F. Lucas.

Products Exhibited: Vincote wall coating compound for spray booths; phosphate coating compounds for rust-proofing; alkali and emulsion cleaning compounds; degreasing solvents and machines and industrial washers.

Detroit Chemical Specialties, 101 S. Waterman, Detroit, Mich. Booths E—23, 24.

Personnel Attending: C. H. McAleer, President; E. Van Zandt, J. J. Ryan, R. E. Whalen.

Products Exhibited: Polishing and Buffing Compounds containing "Lustre Seal"; Polishing and Buffing Compounds; Buffs and Wheels; Rubbing Compounds; Abrasive Belts and Discs.

Diamond Alkali Company, 300 Union Commerce Bldg., Cleveland, Ohio. Booth Q—28.

Personnel Attending: C. E. Grant, E. L. Combs, C. L. Troph, K. S. Lewis.

Products Exhibited: Chromic Acid; Caustic Soda; Bichromate of Soda.

Distillation Products Industries, 755 Ridge Rd., West Rochester, N. Y. Booth E—14.

Personnel Attending: F. C. Comer, J. E. Swope, A. H. Hartman, E. M. Brown, G. C. Waterman.

Products Exhibited: Many examples of high vacuum metallized metal products produced with vacuum coating equipment.

The Diversey Corporation, 1820 Roscoe St., Chicago 13, Ill. Booths O—22, 23, 24.

Personnel Attending: R. L. Shannon, R. J. Stoll, B. B. Button, P. A. Jackson.

Products Exhibited: Diversey Dive-bond; Diversey No. 101; Aluminox.

Dow Chemical Company, 1000 Main St., Midland, Mich. Booth E—13.

Du-Lite Chemical Corporation, Middletown, Conn. Booth E—25.

E. I. du Pont de Nemours & Company, Wilmington 98, Del. Booths C—3, 4.

Electric Products Company, 1725 Clarkstone Rd., Cleveland 12, Ohio. Booths P—9, 10.

Electrofilm Corporation, 7416 Laurel Canyon Blvd., North Hollywood, Calif. Booth E—21.

Personnel Attending: D. Rice, D. Gordon, T. Graff, F. E. Pollock, J. W. De Dapper.

Products Exhibited: Electrofilm "Lube-Lok" Lubrication; Electrofilm "Electro-Flex" heating tape; "Lube-Lox" provides locked in lubrication for all moving parts.

Electronic Rectifiers, Inc., 2102 Spann Ave., Indianapolis 3, Ind. Booth Special Island "A".

Personnel Attending: C. B. Ogle, President; P. B. Freeman, A. V. Beeler, G. E. Gray, W. Craigle.

Products Exhibited: Water Cooled Magnesium Copper Sulphide Rectifiers; Dry Contact Magnesium Copper Sulphide Rectifiers and Power Supplies.

Enthone, Inc., 442 Elm St., New Haven, Conn. Booths P—7, 8.

Personnel Attending: Dr. W. R. Meyer, President; J. F. Buckman, Vice-President; C. C. Helmle, Secretary; plus, Engineers and Sales-Service Personnel.

Products Exhibited: Alkaline Derusting Process with separate demonstration of simultaneous derusting and plating in the same tank; dyed coatings on aluminum; plated coatings on aluminum; black coatings on copper, brass, zinc and steel.

Finishing Publications, Inc., 381 Broadway, Westwood, N. J. Booth Q—18.

Personnel Attending: P. H. Langdon, T. A. Trumbour, J. T. Wiarda, W. A. Raymond.

Products Exhibited: Copies of Metal Finishing, Organic Finishing and annual Guidebook Directories latest editions.

Formax Manufacturing Corporation, 3171 Bellevue Ave., Detroit 7, Mich. Booths D—23, 24.

Personnel Attending: H. J. McAleer, President; E. W. McAleer, Vice-President; E. D. McAleer, Sales Manager; J. J. McAleer, Vice-President; R. D. McAleer, S. Rodger.

Products Exhibited: New inter-locking, ventilated bias type buffing wheel; Buffing Wheels, Polishing Wheels and Buffing Compound.

Gasway Corporation, 6163 N. Ravenswood Ave., Chicago 26, Ill. Booth G—3.

General Chemical Division, Allied Chemical & Dye Corporation, Edgewater, N. J. Booth E—3.

The Globe Chemical Company, Inc., Murray Rd. & Big 4 R. R., Cincinnati 17, Ohio. Booth E—17.

Personnel Attending: M. T. Fogg, K. E. Jund, T. J. Andrews, J. E. Bride, Dr. C. L. Faust, W. H. Safranek.

Products Exhibited: Electropating of Metals; Chemical Polishing of Metals; Immersion Tin Plating; Immersion Lead Plating.

The Gray-I-Flow Corporation, 100 Norwood Ave., Sturgis, Mich. Booth F—7.

Personnel Attending: R. L. Davidson, President; L. B. Davidson, Vice-President; E. B. Bogenm, Chief Engineer.

Products Exhibited: Gray-I-Flo new two deck parts-and-chips separator and chip grader; Gray-I-Flo tumbling process.

W. Green Electric Company, Inc., 130 Cedar St., New York 6, N. Y. Booth B—1.

Hammond Machinery Builders, Inc., 1600 Douglas Ave., Kalamazoo, Mich. Booths B—23, 24; C—11, 12.

Personnel Attending: S. H. Miller, R. N. Shaw, R. M. Bell, L. N. Albrecht.

Products Exhibited: Model C-46-40, continuous rotary with four 15 HP; Model C-4120, abrasive belt unit for converting buffing heads to polishing heads; Model 51-94, polishing and buffing head stand unit; variable speed polishing and buffing lathe for buffing; Cyclone Type Duskdector; Contour Abrasive belt finisher; four different styles of automatic polishing, buffing and deburring heads.

Hanson-Van Winkle-Munning, Church St., Matawan, N. J. Booths P—18, 19, 20, 21; Q—11, 12, 13, 14.

Personnel Attending: V. W. Todd, Chairman Board; L. M. Hague, President; J. A. Bauer, Vice-President; H. B. Smallman, R. M. Norton, M. B. Diggin, B. C. Case, P. B. Lyons, C. M. Knights, J. D. Kershaw, H. L. Wright, H. W. Marx, G. R. Lyons, M. J. Moll, E. H. Hanlon, W. R. Lockwood, C. A. Pickering, C. E. A. Solla, W. M. Teets, G. G. Knecht, R. R. Grampaist, D. C. Murphy, E. C. Rost, G. E. Verstegen, A. D. Squitero.

Products Exhibited: New Mercil Type Centrifugal Dryer; Horizontal Type Plexiglas Cylinder; Portable Plating Barrel Apparatus; Selenium Type Rectifier; Chrom-Flo Lead Anodes; P. B. Controller; Model Elevator Type Conveyor; Tank Rheostat; Generator Brush Panel; various supply items; laboratory display boards.

The Harshaw Chemical Company, 1945 E. 97th St., Cleveland 6, Ohio. Booths E—10, 11.

Products Exhibited: To emphasize all Harshaw electroplating processes: Acid Tin; Bright Barrel Nickel; Bright Nickel; Cadmium Fluoborate; Copper Fluoborate; Lead Fluoborate; Perflow Nickel; Tin Fluoborate; Zinc Fluoborate.

H. N. Hartwell & Son, Inc., Park Square Bldg., Boston, Mass. Booth F—9.

Personnel Attending: L. N. Thomas, M. Shaw, K. P. Chamberlain.

Products Exhibited: Beltaron non-plasticized rigid polyvinyl chloride; sheets—29 x 59"; bar—½" to 1" diameter; pipe—⅜" to 4" diameter; material—1/16" to 1" thick.

Haveg Corporation, Newark, Del. Booth S—24.

Jacob Hay Company, 4014 W. Parker Ave., Chicago, Ill. Booth E—12.

Personnel Attending: H. F. Gardine, Vice-President; E. De Izaf, Vice-President; F. LeFebvre, A. Hay, B. J. Shields.

Products Exhibited: Special Pouring Spout; Cleanrite Cleaners; Williamsville Buffs; Torit Dust Collectors; Standard Electrical Tool Company—Buffing Lathe; Clearview Filter; Glo-Rod Immersion Heaters.

Heatbath Corporation, Springfield 1, Mass. Booth C—25.

Heil Process Equipment Corporation, 12901 Elmwood Ave., Cleveland 11, Ohio. Booths S—15, 16.

Personnel Attending: C. E. Heil, President; H. P. Heil, E. W. Vereeke, R. J. Peters, K. W. Grader, F. G. Hutle.

Products Exhibited: No. 1251 Exchanger; Lead Anodes; Nocordial; Lined Tanks; Acid-Proof, Systems; Lined Pipe; Fume Scrubbers.

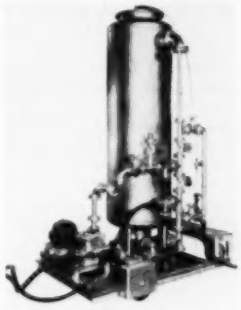
R. O. Hull & Company, Inc., 1300 Parsons Court, Cleveland, Ohio. Booths P—5, 6.

Personnel Attending: R. O. Hull, President; J. B. Winters, E. B. Wild, R. G. Wild, C. H. Miller, R. C. Platt.

Products Exhibited: ROHCO Imperial Silver Brightener; Comet Rectifier; ROHCO Current Tester; Forcite Anode Baskets; "No-Cro-Mist" for chrome baths; Hull Cell Plating Test Sets; miscellaneous chemical products.

Illinois Water Treatment Company, 840 Cedar St., Rockford, Ill. Booth E—26.

Personnel Attending: J. F. Wantz, Secretary-Treasurer; W. S. Morrison, Vice-President; E. H. Kahler, Sales Manager.



Chromium Purifier

Products Exhibited: Ilco-Way Ion-exchange equipment including the new Ilco-Way Chrome Solution; Ilco-Way packaged Deionizers which provide solids free water for plating rinse.

Imperial Plating Rack Company, National Rack Company, American Rack Company, Booths S—13, 14.

Personnel Attending: E. L. Faulman, J. F. Herr, L. D. Faulman, W. Zube, R. Preston, A. Smith, J. Kurdenok.

Products Exhibited: Plating rack and fixtures for all new defense requirements; announcing the opening of the new Imperial Plating Rack Plant No. 2; Naraco plating racks for job plating and automatic machinery.

Industrial Electroplating Company, Inc., 240 W. Vermont St., Indianapolis 1, Ind. Booths D—32, 33.

Industrial Filter & Pump Manufacturing Company, 5900 Ogden Ave., Chicago 50, Ill. Booths R—11, 12, 13.

Personnel Attending: R. E. Liedberg, H. Jensen, H. W. Faint, W. B. Johnson, K. C. Blin, J. F. Brossart, J. R. Miller, M. Van Loan, S. Clements.

Products Exhibited: Modifications and improvements on Filters, Heat Exchangers, Demineralizers and Salt Fog Corrosion Test Cabinets.

International Nickel Company, 67 Wall St., New York 5, N. Y. Booths P—23, 24.

Personnel Attending: R. J. McKay, C. H. Sample, W. H. Prine, L. W. Barber, W. R. Ferguson.

Products Exhibited: Some representative examples of industrial uses for nickel plating.

Kocour Company, 4800 S. St. Louis Ave., Chicago, Ill. Booth O—26.

Personnel Attending: C. Kocour, O. Kocour, L. J. Kocour, E. Hodges.

Products Exhibited: Kocour Electronic Thickness Tester; Kocour Electronic Thickness Tester Accessory Unit; various models of our line of Kocour Test Sets for controlling plating, cleaning, pickling, anodizing and heat treating baths, deposit thickness testing, and other control instruments.

Kraft Chemical Company, Kaynide Division, 917 W. 18th St., Chicago, Ill. Booths S—5, 6.

Personnel Attending: G. G. Kraft, B. Johnson, C. Caruana, H. Stopek, Dr. S. Dobsky, J. Frisco, B. Brandes.

Products Exhibited: Kupromerse—Copper plating by immersion giving copper deposit that is bright, or even color and adherent; Copper Ball Anodes; Zinc Ball Anodes; White Brass Anodes.

Lasalco, Inc., 2818-38 La Salle St., St. Louis, Mo. Booths R—9, 10.

Personnel Attending: H. J. Struckhoff, President; C. R. Hamm, N. K. House, C. H. Pinkerton, A. G. Bignall, B. E. Deigman, K. S. Repp, B. G. Daw, F. A. Merniges, A. P. Weisberg.

Products Exhibited: Lasalco Spiral Type continuous metal parts dryer.

The Lea Manufacturing Company, 16 Cherry Ave., Waterbury, Conn. Booths R—20, 21.

Personnel Attending: R. S. Leather, President; E. W. Couch, R. P. Crane, E. T. Candee, F. L. Bergin, Dr. H. L. Kellner, D. F. Mosher, L. J. Bakinow, S. L. Doughty.

Products Exhibited: Lea Copper Glo; Lea Liquabrade; Leabrasive; Leabeament; Emulsabrade; Leamatic Compound; Lea Greaseless Red Rouge; Learok Extruded and Poured; Lea Red Rouge; Lea Lapping Paste; Lea Liquablue; Grain Lubar; Lea Grease Stick; Leatardent; Lea Silver Glo; Lea Kromsavers and Kromkubes; Lea Lectromag; Lea Spray Gun Mover; Lea Compound; Artab; Learok; Adleasive; Lea Nickel Glo; Lea Mirro-Glo; Lea Clad Cadmium Process; Lea Systrip; Lea Analytical Method of Plating Solution Control.

Lewis Electrical Manufacturing Company, 1943 Walton Ave., New York 53, N. Y. Booth O—21.

Personnel Attending: V. Lubin, General Manager; H. Lewis, President.

Products Exhibited: Lewis Rectifiers; Vari-Plater; Periodic-Reverse Controls.

Charles F. L'Hommedieu & Sons Company, 4521 Ogden Ave., Chicago 23, Ill. Booths C—18, 19, 20, 21.

A. J. Lynch & Co., 2424 Enterprise St., Los Angeles 21, Calif. Booth E—22.

Personnel Attending: J. Beall, W. W. Cadwallader, President.

Products Exhibited: Inet Rectifier.

MacDermid, Inc., Waterbury 20, Conn. Booths R—27, 28.

Personnel Attending: H. Leever, Vice-President; W. Innes, Technical Director; E. F. Stack, T. F. O'Brien.

Products Exhibited: MacDermid Bright Copper; MacDermid Chemical Bright Dips; Phosphate Materials; Cleaning and Burnishing Compounds; Laminex Fiberglas Tanks.

The Matchless Metal Polish Company, 840 W. 49th Place, Chicago 9, Ill. Booths O—19, 20.

Personnel Attending: E. G. Coffey, Vice-President; I. E. Olson, G. Lambert, J. Raven, P. E. Unruh, D. Whittenburg.

Products Exhibited: Linear Perm-A-Cote Buff; Tampico Perm-A-Cote Buff; Treated Sisal Buff; Rubber Contact Wheel; Liquid Stainless Steel Compound; Liquid Tripoli Compound; Liquid White Finish (nickel compound); Liquid Chromium Compound; Belt Lubricating Grease Stick; our regular line of buffing compounds, buffs and polishing wheels.

The McGean Chemical Company, 25 Prospect Ave., N. W., Cleveland 15, Ohio. Booths B—11, 12.

Metal & Thermit Corporation, 100 E. 42nd St., New York 17, N. Y. Booths D—15, 16.

Michigan Buff Company, Inc., 3503 Gaylord, Detroit, Mich. Booth E—22.

Personnel Attending: A. W. Payson, President; O. J. Horsch, O. B. Herbert, C. G. Dinallo.

Products Exhibited: Polishing Wheels

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ARCO rubber covered diaphragm plating installation, Ford Motor Co., Monroe Plant
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Let ARCO engineers assist you in converting to the "Diaphragm" method of plating.
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(Proven); Buffs; Compound; Tampico Brushes; Felt Wheels.

Frank Miller & Sons, 2250 W. 58th St., Chicago 36, Ill. Booth E—35.

J. C. Miller Company, 631 Chestnut St., Grand Rapids, Mich. Booths P—14, 15.

Personnel Attending: J. C. Miller, President; G. H. Walgren, F. W. May, J. A. Badaloco, W. L. Morgan, L. Phillips, R. Slater, H. Grutter, J. Howell, P. Burnham, S. B. Cowdery, P. Waalkes, W. Hakken.

Products Exhibited: Liquimatic Liquid Buffing Compounds; Liquimatic Automatic Application Equipment; Buffs; Bar Buffing Compounds, all types; Polishing Wheels; Finishing Equipment.

Minnesota Mining & Manufacturing Company, 900 Fauquier Ave., St. Paul 6, Minn. Booth P—22.

Mitchell-Bradford Chemical Company, 2446 Main St., Stratford P. O., Bridgeport, Conn. Booth C—24.

Munning & Munning, Inc., 202-208 Emmett St., Newark 5, N. J. Booth B—6.

Nelson Chemicals Company, 12345 Schaefer Highway, Detroit, Mich. Booths B—22, 23.

Personnel Attending: L. J. Nelson, M. Nelson, A. O. Bragg, C. Nelson, H. B. Nelson, C. J. Molyneaux.

Products Exhibited: Nelson's Cold Cleaner; Gripmaster Polishing Wheel Cement; Cyanex for Cyanide Waste Treatment.

Nobles Engineering & Manufacturing Company, 645 E. 7th St., St. Paul 6, Minn. Booth P—12.

Personnel Attending: W. H. Nobles, President and General Manager; W. F. Kramer, Secretary and Assistant General Manager.

Products Exhibited: Nobles Centrifugal Dryer.

Oakite Products, Inc., 19 Rector St., New York 6, N. Y. Booths P—16, 17.

Personnel Attending: F. J. McNally, D. N. Clarin, M. Maher, P. Veit, E. Lucy, E. W. Neuenhahn, W. W. Cothran, R. J. Baltzell, W. L. Higgs, V. T. Wissen, E. H. Olson, A. A. Becker, R. J. Becker, K. J. Birdwell, G. Lux.

Products Exhibited: Composition No. 90, for reverse-current cleaning of steel; Composition No. 91 and 91A for cleaning copper and copper alloys, especially brass and nickel silver, prior to electroplating; many other materials will also be featured.

Paasche Airbrush Company, 1909 Diversey Parkway, Chicago 47, Ill. Booths E—19, 20.

Parker Rust Proof Company, 2177 E. Milwaukee, Detroit 11, Mich. Booths F—1, 2.

Perma-Line Rubber Company, 1755 N. Winnebago, Chicago, Ill. Booth D—17.

Phillips Manufacturing Company, 3475 Touhy Ave., Chicago, Ill. Booth C—1.

Personnel Attending: J. M. Bash, President; L. B. Anderson, Secretary-Treasurer; H. J. Beierwaltes, E. W. Crooker, O. J. Richiardi, J. Pompei.

Products Exhibited: Vapor Degreasers, Tumbling Rotomatic.

Plating Magazine, 445 Broad St., Newark 2, N. J. Booth P—11.

Precision Metal Molding Magazine, 1240 Ontario St., Cleveland 13, Ohio. Booth C—17.

Personnel Attending: I. B. Hexter, President; L. P. Aarbach, J. B. Peskin, D. Veit, P. Kalisher, F. P. Mignin, R. Gross.

Production Machine Company, Greenfield, Mass. Booth S—7.

Personnel Attending: R. B. Robinson, F. E. Pennell, R. W. Schwartz.

Products Exhibited: Type 484 Duplex Centerless Polishing and Buffing Machine for cylindrical work.

Products Finishing, 431 Main St., Cincinnati 2, Ohio. Booth Q—25.

Personnel Attending: R. S. Kline, F. Bonem, J. M. Krings, G. E. Hay.

Products Exhibited: Products Finishing Magazines.

Promat Division, Poor & Company, 851 S. Market, Waukegan, Ill. Booth Special Island "C".

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 785.

Rampe Manufacturing Company, 3329 St. Clair Ave., Cleveland, Ohio. Booth E—20.

Personnel Attending: J. F. Rampe, P. A. Rampe.

Products Exhibited: Small size Tumbling Machines.

Ransburg Electro-Coating Corporation, 1234 Barth Ave., Indianapolis, Ind. Booths C—32, 33, 34; D—1, 2, 3.

Personnel Attending: M. F. Plevin, J. F. Maxwell, R. H. Stone, R. E. Helmuth, R. Peoples.

Products Exhibited: Ransburg No. 2 Electro-Spray Process.

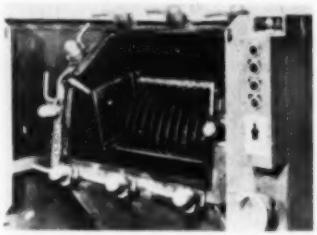
Rapid Electric Company, 2881 Middletown Rd., New York 61, N. Y. Booths E—8, 9.

Personnel Attending: J. A. Viola, President; P. P. Bruno.

Products Exhibited: Self-contained selenium rectifier with built-in automatic timing and programming controls; basic and standard rectifier designs; automatic periodic reversing controls; meters, shunts, and other rectifier power accessories.

Rushed-Mason Company, 5935 Milford, Detroit 10, Mich. Booth G—5.

Roto-Finish Company, 3700 Milham Rd., Kalamazoo, Mich. Booths P—3, 4.



Roto-Finish Stationary Fixture Machine on Display at the Exposition

Personnel Attending: D. T. Barrett, President; C. H. Castle, J. W. Servaas, R. T. Bonnin, R. E. Cook, A. R. Hatfield, L. W. Evans, W. L. Reed, P. W. Sheppard, R. E. Streich.

Products Exhibited: Stationary Fixture Roto-Finish Machine; Standard Automatic Control Roto-Finish Machine.

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y. Booth P—2.

Products Exhibited: Type LSI electric, indicating temperature controller; float thermostatic steam traps; degreasing controls.

Schaffner Manufacturing Company, Inc., Schaffner Bldg., Herron Ave., Emsworth, Pittsburgh 2, Pa. Booths S—8, 9.

Personnel Attending: G. J. Schaffner, Jr., Treasurer; P. E. Schaffner, President; R. D. Schaffner, Vice-President; S. Zeitman, J. R. Schaffner, R. Henry, W. A. Nelson.

Products Exhibited: "Grip-Grain" cold cement for polishing wheels; complete line of Spray Compound; "Little Doc" Disolvit Platers' and Buffers' Waterless Hand-Cleaner; Buffing Wheels; Polishing Wheel Cement; Grease Sticks; Hand-Cleaner; Schaffner's complete line of polishing and buffing compositions.

J. J. Siefen Company, 5657 Lauderdale, Detroit 9, Mich. Booth G—4.

Personnel Attending: J. F. Siefen, J. B. Siefen, A. J. Emmerich, E. Brisson, A. Darnell, C. DeGroat, I. V. Hood, C. A. Sayers, A. E. Seeley, O. J. Jacobsen.

Products Exhibited: Siefen Spray Gun; Siefen Time Valve; Siefen Cam Valve; polishing and buffing compounds.

Solventol Chemical Products, Inc., Detroit 3, Mich. Booth S—23.

Personnel Attending: H. B. Downs, K. O. Lenhard, A. A. Schwartz, R. L. Brown, J. Nimesman, J. R. Ewing.

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South Florida Test Service, 4201 N. W. 7th St., Miami 34, Fla. Booth S—25.

Personnel Attending: E. M. DeNoon, W. W. Smith.

Sparkler Manufacturing Company, Mundelein, Ill. Booth B—8.

Personnel Attending: C. J. Yeager, B. Erickson, E. S. Anderson, D. Paisley, H. Murphy.

Products Exhibited: 1—18" Horizontal Plate Back Wash Filter; filter sizes ranging from 40 G.P.H. to 10,000 G.P.H.; Rubber Lined Horizontal Plate Filter; Cutaway Filter showing internal parts of filter.

The Standard Electrical Tool Company, 2488 River Rd., Cincinnati 4, Ohio. Booth D—18.

Personnel Attending: W. A. Ferguson, President; J. J. Falls, R. A. Huhn, J. J. Klopp, B. C. Dalton, P. P. Wagener.

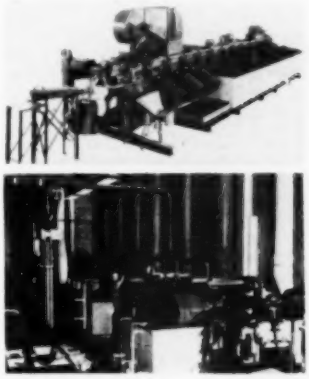
Products Exhibited: Infinitely variable speed buffing and polishing lathe; two-speed range infinitely variable buffing and polishing lathe.

Standard Plating Rack Company, 1913 N. Paulina Ave., Chicago, Ill. Booth O—27.

Personnel Attending: M. S. Schneider, President; H. E. Younger, F. Nielsen, J. Maskowicz, R. Voigtmann, E. Stenberg.

Products Exhibited: Plating racks, rubber molded masks.

F. B. Stevens, Inc., 1300 18th St., Detroit, Mich. Booths P—25, 26, 27, 28, 29, 30, 31; Q—1, 2, 3, 4, 5, 6, 7.



Stevens "Standard" Full Automatic Return Type Small Parts Plating Machine (Top) and Stevens Model C Small Parts Machine (Bottom)

Personnel Attending: W. J. Cluff, President; F. Watt, C. A. Mitchell, C. Menzemer, A. Kirkpatrick, G. Cummings, C. C. MacDonald, H. Stevens, G. D. Stevenson, H. M. Brown, T. Williams, J. Johnston.

Products Exhibited: The availability of a newly released motion picture "Industrial Album" that features the Stevens automatic barrel in a materials handling role at Shake Proof, Inc., division of Illinois Tool Works; Full Automatic barrel plating and processing machine; Variable speed lathe; Compositions.

George A. Stutz Manufacturing Company, 1631-47 Carroll Ave., Chicago, Ill. Booths O—8, 9, 10.

Personnel Attending: G. A. Stutz, President; A. A. Jenks, Vice-President; J. B. Niles, Secretary; and other gentlemen from their sales force.

Products Exhibited: Plating Barrel (Lucite Portable and Production Plating Barrels); Rectifier.

Titeflex, Inc., 500 Frelinghuysen Ave., Newark, N. J. Booth R—26.

Personnel Attending: E. E. Husted, III, L. Williams, E. O'Connell.

Products Exhibited: Filters, backwash type.

Topper Equipment Company, 24-30 Main St., Matawan, N. J. Booth D—25.

Personnel Attending: M. Morris, President; K. Hirtle, J. Lawson, J. Bovett, J. Connolly.

Products Exhibited: Circo Steam Cleaner; Circo Vapor Degreasers.

New **ASI** *Filter*

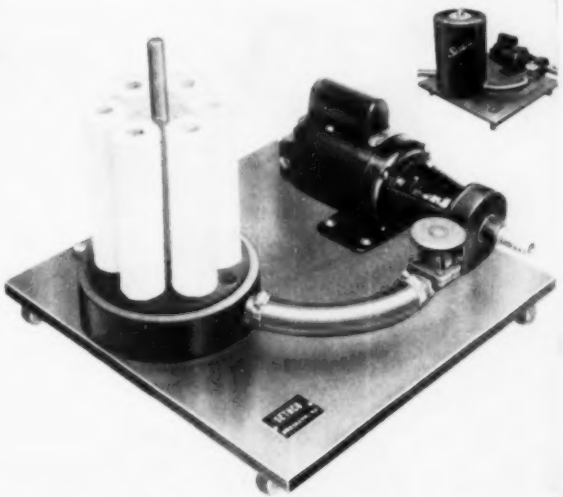
PUMP SERIES

Features:

- Capacity—up to 850 gal-hr.
- Corrosion proof construction. Pump and fittings—stainless type 316. Filter Assembly resists both acids and alkalis.
- Heat Resistant (up to 250° F.). Filter assembly fabricated of *SETHRIN Resins.
- Compact—Simple operation.
- Economical operation.

Write Now for Descriptive Literature—Dept. P.

*Trade Name



MODEL ASI-600 FILTER PUMP (Parts supplied for)

Large illustration shows inside of shell.

SETHCO • 78 WILLOUGHBY STREET BROOKLYN 1, NEW YORK

H. O. Trerice Company, 1422 W. Lafayette Blvd., Detroit, Mich. Booth S—40.

Personnel Attending: J. L. Brackett, S. B. Mercer, F. Barclay, H. Trerice, E. Myers, H. O. Trerice, President.

Products Exhibited: Complete line of Thermometers, Temperature Controls and Steam Traps.

Turco Products, Inc., P. O. Box 2649, Terminal Annex, Los Angeles 54, Calif. Booth S—26.

The Udylite Corporation, 1651 E. Grand Blvd., Detroit, Mich. Booths T—1, 2, 3, 4.

Personnel Attending: L. K. Lindahl, President; C. H. Reeme, L. V. Nagle, L. J. George, J. V. Davis.

Products Exhibited: New Udylite full automatic processing cycle including spray wash automatic conveyor loader; rectifiers; horizontal plating barrel; valveless automatic filter; Udylite Jr. full automatic automatic unloader and hot air dryer.

United Chromium, Inc., 100 E. 42nd St., New York 17, N. Y. Booths S—27, 28, 29.

Personnel Attending: H. D. McLeese, T. G. Coyle, H. Mahlstedt, M. Shucat, J. Fulfeith, R. H. Dudley, E. M. Bellitz, C. W. Carter, W. H. Mikesell, H. P. DeWitt, J. A. Williams, F. J. Edwards.

Products Exhibited: Tantalum Heating and Cooling Coils; Chromium Plating Anodes; Stop-Off Compounds; Clear Enamels; Dips for Zinc and Cadmium; Selenium Rectifiers; S.R.H.S. Chromium Plating Baths; Stop-Off Lacquers; Resist Materials; Pyrophosphate Copper; Coating 218X; Anozinc; Ucilon Protective Coatings.

United States Department of Commerce, Chicago, Ill. Booth C—2.

The Van Dorn Iron Works Company, 2685 E. 79th St., Cleveland 4, Ohio. Booth E—31.

Personnel Attending: J. E. Jones, W. Hatfield, C. R. Owen.

Products Exhibited: Industrial Plastic material which resists corrosion and acids; extrude pipe and fabricate air ducts, hoods, plating racks of non-plasticized polyvinyl chloride material is known as Lucoflex and Geon.

Wagner Brothers, 800 Midland Ave., Detroit 3, Mich. Booths R—24, 25.

Personnel Attending: J. R. Wagner, President, F. W. Wagner, W. H. Ross, O. H. Tiedemann.

Products Exhibited: Anode Products—"Flat Top" "Iso Cast" Zinc, Copper, Nickel, Brass; Wagner-Tiedemann Rectifiers.

Wallace & Tiernan Company, Inc., Belleville, N. J. Booth E—1.

Personnel Attending: H. B. Snyder, N. S. Chamberlain, D. Robertson, C. C. Alspaugh, L. J. Beckman, J. S. Perry, E. F. Kinney, A. Campbell.

Products Exhibited: Chlorinators for the oxidation of cyanide wastes; automatic chlorination control and recording equipment; equipment for the reduction of chromium wastes.

Edwin L. Wiegand Company, 7500 Thomas Blvd., Pittsburgh 8, Pa. Booth—Special Island "D".

Personnel Attending: C. F. Kreiser, J. L. Devlin, W. L. Thomson.

Products Exhibited: Radiant electric panel for infrared ovens; electric strip heaters, ring heaters, cartridge heaters, steam super heaters, and immersion heaters, typical of more than 15,000 types, sizes and ratings for industrial jobs.

Wyandotte Chemicals Corporation, Wyandotte, Mich. Booth R—19.

Personnel Attending: P. N. Burkard, R. J. Racine, E. J. Kubis, A. W. Liger, H. E. Hastedt, R. K. Tucker, L. A. Dunn, A. S. Kiefer, S. Johns, J. Poulson, R. J. Rosenthal, J. E. Vaughan.

Products Exhibited: Wyandotte Pre-Fos, outstanding cleaning-phosphating compound; line of metal cleaning and related products.

ANNUAL REPORTS OF OFFICERS

of the

American Electroplaters' Society

PRESIDENT'S REPORT

Nixon

The Executive Board, elected last August by the American Electroplaters' Society's governing body—the Supreme Society, has sought throughout the year to further the object of the Society and, with the help of the National Office Staff, to transact its business effectively and economically. It has met several times during the year for this purpose:

August 3, 1951 in Buffalo (the Friday following the Buffalo Convention)
September 29 and 30, 1951, in Philadelphia
November 24 and 25, 1951, in Philadelphia
February 8, 9 and 10, 1952, in Philadelphia. (On the 9th, the Board met with the Supreme Society in a special meeting.)
April 26 and 27, 1952, in Newark
June 15, 1952, in Chicago (the day before the opening of the Chicago Convention)

In addition, a considerable correspondence has been necessary between meetings. All members of the Executive Board have attended committee meetings and meetings of Branches other than their own in the interest of our national organization.

National Headquarters Changes

The work of the year has been complicated by a number of changes which it has been necessary to make in our National Headquarters Staff and also in the location of the Headquarters itself. Dr. D. Gardner Foulke officially became our full-time Executive Secretary on the 1st of December after three months of training under Dr. A. Kenneth Graham. Dr. Graham, who resigned his position as part-time Executive Secretary in order that he might devote his full time to other business, continued on in an advisory capacity until the 1st of January.

In order to provide the added space needed and in order to secure a more central location, our National Headquarters was moved, officially on the 1st of April, from 473 York Road, Jenkintown, Pa., to the American Building, 445 Broad Street, Newark, N. J.

In order to accept a teaching opportunity, our editor, Gustaf Soderberg, resigned effective May 9. He has not as yet been replaced.

Changes in the clerical help needed to conduct national office work also occurred. Despite the difficulties incident to moving and reorganization, Dr. Foulke has proved himself capable. It is a pleasure to say confidently that our national office continues in good hands.

Internal Public Relations

For the two years preceding this one, we had a Public Relations Committee, headed by Mr. W. M. Phillips. A part-time publicity man was engaged and a number of general interest articles on plating were prepared and published. In addition, a considerable number of items suitable for newspaper publication were released—all to promote the thought that quality plating is a thing to be desired both because it enhances the beauty of the object plated and because it increases serviceability. For this work we appropriated $3,600.00 from our General Fund for each of the two years and spent somewhat more. (The $7,200.00 was thought of as coming from the earnings of our two preceding Industrial Finishing Expositions—Detroit and Atlantic City.) It is the opinion of those experienced in this type of work that for the money spent we obtained very good results. It was, however, the opinion of such men that the amount we had to spend was woefully inadequate for our purpose. For example, the cost of one institutional type advertisement in the Saturday Evening Post might cost more than we spent for the entire two years' effort. Travel, photography, and writing expense that we would have to bear, at least in part, involved in producing feature stories attractive to important magazines run high.

There were many in our Society who felt that we were out of character as an educational organization in engaging in such activity. Effort of that sort, it was felt by some, is more appropriate to a trade association—especially since a trade association is likely to have more money for the purpose. Therefore, after much discussion, our started public relations program was turned over to the newly organized Metal Finishing Suppliers' Association (the old International Fellowship Club) while our own public relations program was converted to what we of the Executive Board call our Internal Public Relations Program.

It is the feeling of the present Executive Board that if we can convey a better understanding of our aims and plan of operation to our members, we can in turn learn from them how to serve them better. If we thus sell ourselves to ourselves, we may hope to attract others who need A. E. S. If we can attain what we think is a reasonable objective in membership—10,000 we will gain much in both revenue and influence and so, in ability to serve ourselves.

Our Constitution provides a form of government well adapted to a two-way flow of information and of ideas. Our Supreme Society is made up of three elected delegates from each of our forty-six Branches. Its 138 members constitute our governing body. It would be impractical because of the expense and because of the time involved for this large group to meet often to handle the business of the Society; therefore, it elects an Executive Board of five members to act in many ways for it. Too often, however, it has been felt, perhaps because executive boards in the past have functioned efficiently, that its job has been completed when the executive board was elected. The importance attached to the delegate job has been allowed to dwindle.

For some time, executive boards have been concerned and have felt responsibility for finding a way to meet the situation. The present Executive Board feels strongly that, if a way can be found to adequately inform delegates as to current problems, the Supreme Society will meet its responsibility more adequately and that a stronger, larger, and more useful A. E. S. will result.

Perhaps the most important item of our still forming internal public relations

program, therefore, has had to do with delegates. On September 12, the President, in behalf of the Executive Board, sent the first of a series of letters to members of the Supreme Society. In it an attempt was made, among other things, to state briefly the accomplishments of the last annual meeting and to provide a list of delegates and alternate delegates to facilitate correspondence within the Supreme Society. On November 9, a second letter presented in detail the current situation with regard to the Research Committee. Then, on February 9, a Special Meeting of the Supreme Society was called in Philadelphia for the purpose of hearing reports and exchanging views on important Society matters. Twenty-one of our Branches were represented at this meeting attended by nearly fifty people. A stenotypist made it possible to prepare a complete report of the proceedings of the meeting, which has been placed in the hands of all delegates and branch secretaries. Those who attended thought the meeting sufficiently worthwhile to recommend unanimously that special meetings of the kind be held in the future.

As a part of our internal public relations effort, our Executive Secretary, our Editor, and our Advertising Manager have been encouraged to visit Branches whenever possible for the purpose of explaining their jobs and to hear Branch criticism first-hand. It is to be hoped that our Branches in support of this program will invite our staff people to visit them occasionally. We need to improve as much as we can our present means for disseminating knowledge, taking fully into account the fact that we serve both those who are interested in the scientific aspects of electrodeposition and those who are responsible in their daily work for production electroplating operations. It seems evident that one of the best ways to accomplish this purpose is to help those who work for us to know us better.

For some time consideration has been given to the establishment of an A. E. S.-sponsored elementary correspondence course in electroplating. As a part of our internal public relations program, our Branches have been consulted as to the need for such a course. Absence of interest revealed by this survey has led the Executive Board to drop the subject.

On the other hand, interest in an electroplating handbook continues strong. We therefore continue to seek a workable means for achieving this objective.

Inter-Society Relations

Co-operation with other technical groups is important.

On February 2, the President represent A. E. S. at a dinner given by the Drexel Institute of Technology located in Philadelphia honoring the technical societies of the United States.

Walter Pinner and Walter Meyer represent A. E. S. on an international committee to plan and to regulate international meetings on electroplating.

The Bureau of Standards held a three-day symposium on advances in the field of electrodeposition on December 4, 5, and 6. Nearly all of one day was given over to reports on the progress of our Research Committee's program.

An A. E. S.-A. S. T. M. liaison committee headed by Bernard Case has smoothed the way for joint sponsorship of a number of new plating specifications and recommended practice articles.

Dr. William Blum attended, as official A. E. S. representative, a dinner to celebrate the 75th anniversary of the American Chemical Society. For us, he presented a congratulatory scroll.

The American Electroplaters' Society is represented on the Inter-Society Corrosion Committee, sponsored by the Society of Corrosion Engineers, by R. M. Wick and W. A. Wesley. Dr. Wick was elected Vice-Chairman of the Inter-Society Corrosion Committee at its March meeting held in Houston, Texas.

Walter Pinner, William Neill, and others continue to make A. E. S. an important factor in the furtherance of the work of the Ohio River Valley Water Sanitation Commission. Mr. Pinner is Chairman of its important Metal Finishing Industry Action Committee, concerned with the disposal of plating room wastes.

I have in this report, to avoid making it overlong, touched only high spots. It is, in any event, but a part of a team report. The help received from the other members of the Executive Board, from those who make up our National Headquarters Staff, and from the many Branches and individual members has made it truly a pleasure and a privilege to serve as President. The growth of a society such as ours is, properly, a gradual thing. If we have achieved a forward step this year, it is because the way was cleared for us by the action of former boards. We will be pleased if it can be said at some future date that we have this year contributed something to the progress the coming years are sure to bring.

It is particularly hoped that the aspiration for a National Headquarters building of our own, mentioned by Past President Neill in his report of last year, will stay strong. The time, perhaps, is not now—but, if we keep thinking about it as our organization becomes larger and closer knit, the day not too far removed will come when the venture will be both desirable and possible.

As it becomes my turn to join the distinguished company of past presidents, I am moved to make a suggestion: It would be good for the organization to establish as a part of our plan of operation that non-delegate past presidents have the privilege of the floor, without vote, at all meetings of the Supreme Society. Past Presidents have a knowledge of and an interest in Society affairs that should not, I submit, be allowed to lapse.

C. F. Nixon

FIRST VICE-PRESIDENT'S REPORT

Mac Stoker

This office has been concerned traditionally, along with some others, with the educational features both technical and practical that will make for a program of interest and value to our diverse membership. It is our aim to report developments in plating and the introduction of new processes that enhance and make more serviceable the products that pass through the hands of the plater and metal finishers. To this end, effort is made yearly to prepare a list of capable speakers who will in general be glad to appear before the Branches and speak on chosen subjects. Branch Secretaries and Librarians need only to contact the speakers or their companies to prepare a season's program in advance. Not all of them can go everywhere. Some of them have a limited territory and itinerary, but arrangements and dates can be made with these speakers who have subject matter which will interest your Branch Librarian and members. This list of speakers is, of course, supplemented by others who are known to the local Branches and Librarians, and who can be contacted in the locale in which they are active and who would be glad to address the members.

During the past year your First Vice-President, at the direction of President C. F. Nixon, made a survey of the Branches and their membership relative to the possibilities in connection with an elementary correspondence course in electroplating. A need had been expressed by some individuals and groups in this connection and a course of that nature was reviewed by the Editorial Board. It

was thought that this course or some other would be sponsored by the Society. However, the survey did not give a positive reaction in its favor. While some of the Branches were in favor, most of them were not. About 30 per cent of the Branches answered the survey letters and a number of them were in favor of other educational activities. Some were in favor of more technical school class opportunities and some thought highly of the publication of an Electroplaters' Handbook. The Executive Board will act on these recommendations when possible; the means are being explored at the moment by the Board. Another source of education and information will be had through the pursuance of the Internal Public Relations Program inaugurated last year, but we hope broadened and enlarged during this year and those ahead, whereby your National Officers and Headquarters Staff will be available for both of these purposes. The Internal Public Relations Program will, we think, be fruitful in many ways for better understanding, information, education, and personal contact of officers and staff with the rank and file of the membership, and will provide the opportunity for discussion on many things.

Again I would like to express the need both from the standpoint of speaking subjects and also for insertions in PLATING of the so-called but not really so *practical paper*. As you know, in modern electroplating most articles and papers have a background of sound technical fundamentals. The practical plater of this day is aware of this and uses such fundamentals. We surely could use more of these papers.

In conclusion, let me express my appreciation to those individuals, officers and members, with whom I have worked and those Branches who have answered my letters and queries, and my fellow officers of the Executive Board and the Headquarters Staff for their guidance and support and to the rank and file of the membership with whom I have tried to meet, but not too successfully, during the year just passed.

FRANKLIN J. MACSTOKER

SECOND VICE-PRESIDENT'S REPORT

Swift

Membership in the A. E. S. is my particular topic this year and it has been quite interesting. Permanent charters have been granted to Dallas-Fort Worth and Houston while organizational plans have developed at Kansas City so that we now have 46 active branches and one prospective branch.

The various aids to membership growth have been investigated and the following assets are and have been available for some time: A. E. S. Facts; Membership pins including a past president type; membership certificates, membership application blanks, membership cards, "Plating", "Proceedings", Research Reports, Annual Convention, Regional meetings and Branch meetings both monthly and annual. A check of the membership list shows that but little is known concerning the occupations and interests of most of our members. A membership survey has been undertaken for this purpose and cooperation of the Delegates and Branch officers is necessary if we are to obtain the desired results. This was stressed at the Special Delegates' Meeting in Philadelphia February 9 and must be followed through to completion.

A revision of A. E. S. Facts has been undertaken and will soon be available as an aid to your local membership campaign. An attempt has been made to make it simpler and yet cover all pertinent points.

As of March 31, 1951, 27 Branches of the 46 had increased their membership. The Melbourne Branch led the first group of Branches (largest membership) with a net gain of 33.3 per cent, followed by Chicago and Toronto (a newcomer to this group) with 15.0 per cent and 11.6 per cent, respectively. The Buffalo Branch led the second group with 25.4 per cent gain, followed by Indianapolis and Syracuse with gains of 23.3 per cent and 22.4 per cent. In the third group of smaller branches the Dallas-Fort Worth Branch led with a gain of 12.5 per cent followed by Houston with a 9.6 per cent gain and Saginaw Valley with a gain of 26.3 per cent. A study of the accompanying chart indicates a loss of membership by some of the Branches, but all-in-all the Society is continuing to grow and as of March 31, 1952 the total membership is 5,648 as against 5,392 last year. This year the Society gained 688 new members and the net gain was 256 members.

Your Second Vice-President has attended all meetings of the Executive Board, as well as Regional and Branch meetings when possible. Every effort available under the present circumstances has been used to promote membership and the administration of President Cleveland F. Nixon.

I deeply appreciate the cooperation of the other members of the Executive Board during the past busy year and have ex-

Necrology

The following members have died during the year. Many of them contributed greatly to the advancement of the Society, which, with their Branches and friends, mourns their passing:

Bridgeport Branch: W. Thompson
Columbus Branch: K. J. Miller, Sr.
Detroit Branch: Guy M. Cole, T. C. Eichstadt
Grand Rapids Branch: A. Phillips
Hartford Branch: W. J. Schiffer
Los Angeles Branch: J. Sunderhaus
Newark Branch: W. J. Devoti, J. DeVries, Horace Smith
New Haven Branch: W. F. Bridgett, J. H. Chamberlain
New York Branch: A. Bregman
Pittsburgh Branch: R. B. Stanovich
Rochester Branch: S. P. Gartland
San Francisco Branch: L. A. Delamothe
Syracuse Branch: O. LaBrecque
Toronto Branch: L. S. Williams, J. Bert Gerrans
Twin City Branch: E. W. Presser
Member-at-Large: A. W. Hothersall, G. G. Southall

MEMBERSHIP REPORT

March 31, 1952

BRANCH	Membership April 1, 1951	Initiated	Reinstated	Transferred In	Transferred Out	Resigned	Suspended	Dead	Net Gain	Membership March 31, 1952
Altoona	45	1				4	3		− 7	38
Allentown-Reading	82	3		1			5		2	84
Baltimore-Washington	87	10		1	2	1	3		9	96
Boston	151	12	1		2	1	19		− 11	140
Bridgeport	152	9		1		5	2	1	2	154
Buffalo	85	22		1			1		22	107
Chicago	469	62	5		1	2	2		60	469
Cincinnati	88	7	1		1	6	9		− 8	80
Cleveland	205	21	5	4	5	6	17		7	212
Columbus	54	11	2		1		11	1	0	54
Dallas-Fort Worth	31	38		2	2				38	69
Dayton	82	2			2	1			− 1	81
Detroit	497	48	6	4	11	12	10	2	3	500
Grand Rapids	154	16	1	2	5	2	15	1	− 4	155
Hamilton	25	3					6		− 3	22
Hartford	132	17			1	1	1	1	11	143
Houston	23	8		7					15	40
Indianapolis	92	20	1	2	1				22	114
Jackson-Lansing	82	9		1	2		1		7	89
Lancaster	60	10			1	1	1		7	67
Los Angeles	211	24	3	5	2	8	14	1	7	218
Louisville	23	1							1	24
Melbourne	126	49	1			4	4		42	168
Milwaukee	143	11				2	7		2	145
Montreal	77	7				4	8		− 5	72
Newark	239	12	2	2	4	4	9	3	2	240
New Haven	108	3			2	2	17	2	− 20	88
New York	274	35	1	1	2	1	6	1	26	305
Philadelphia	200	19	10	1	1	3	27		2	202
Pittsburgh	132	10	0	3	2	2	17	1	0	132
Providence-Attleboro	100	4	1	2	1	2	12		− 8	92
Rochester	88	13			1	2	9	1	0	88
Rockford	82	12	1		4		...	...	12	76
Saginaw Valley	82	23	1	1	3	1	5		18	71
St. Joseph Valley	71	10		1	2	2	4		3	74
St. Louis	103	1	1				7	...	− 5	102
San Francisco	65	9	7		2	2	9	1	2	67
Southeastern	48	5	2				8		− 1	47
Springfield	53	7	1	1		1	8		0	53
Sydney	83	3	13			5	18		− 7	86
Syracuse	85	23	3			1	9	1	19	104
Toledo	43	1			1	1	3		6	39
Toronto	127	17	2		6			2	11	132
Twin City	99	8	3		1	4	1	1	0	99
Waterbury	109	9		2	2	3	14		− 11	113
Western Ontario	23	3		1			10		− 4	19
At Large	130	20	3		1	3	15	2	− 3	125
In Transfer	30		7						7	23
Total	5,092	695	93	46	71	114	374	22	250	5,048

perienced the same attitude in the various Branches. It has been an extremely pleasant association.

GEORGE P. SWIFT

THIRD VICE-PRESIDENT'S REPORT

Schaefer

The Third Vice-President, as Junior member of the Executive Board, has no specific constitutional duties or responsibilities other than advisor to the Host Branch Exhibits Committee. During the year he has compiled and rewritten a suggested procedure for branch and individual exhibits to pass on to the future host branch exhibit committees. The fine branch and individual exhibits for the 1952 Convention have been arranged by Mr. Hansen and his Host Branch Committee.

Since the Third Vice-President is the most recently elected officer of the Supreme Society, he has both the opportunity and the duty to bring before the Executive Board the current thinking and problems of the members on policy matters. In this connection he has contributed in a modest way in the operation of the Supreme Society. The varied experience which he has been privileged to acquire as a member of the Editorial Board and the Research Committee has helped him immensely in Executive Board discussions and decisions involving these problems, including active participation in the Research portion of the program at the recent Special Delegates' meeting in Philadelphia. The untimely death of Mr. Cole, early last fall, left a serious shortage of experienced personnel in the Research Committee which the Third Vice-President was able to fill. As a result of this active participation in the Technical Administration of the Research Committee, your Third Vice-President's spare time has been taxed quite heavily. It is regrettable that his work has restricted his time somewhat so that he was unable to visit as many branches as he had hoped. To this extent his role has been somewhat unorthodox, but always, he believes, with the best interest of the Society in mind.

He has enjoyed working with the Executive Board and deeply appreciates his election to this office by the delegates at the 1951 Buffalo Convention.

R. A. SCHAEFER

EXECUTIVE SECRETARY'S REPORT

Foulke

Income and Expenditures

The Financial Statement following this report gives a clear picture of the condition of the Society. The over-all report indicates that financially we are in good shape, but as a matter of record, it should be pointed out that income from PLATING continues to be necessary to help defray the costs of the operation of the Society. The deficit in the Society account this year amounted to $9,652.01 as shown in the auditor's report. Actually, the deficit for the operation of the Society should have been higher and we believe it should be so stated in this report. A considerable portion of the 1951 Proceedings cost ($3,200.55) was paid after the beginning of the 1952-1953 fiscal year and we, consequently, feel that we should report to you an actual deficit for the year 1951-1952 of $12,852.56 or $2.27 per member. In our report to you next year we shall transfer $3,200.55 from this year's excess of income over expenditure to the Proceedings account to cover this item and give a true picture of operating expenses for 1952-1953.

With regard to the General Fund Balance Sheet, we should like to point out that the first item, Demand Deposit, does not give a clear picture of the cash on hand. Of the sum on deposit March 31, 1952, $37,658.98, the following amounts are earmarked funds and not available for current expenses: Convention Account, $2,170.85; Carl E. Heussner Award, $3,125; Industrial Finishing Exhibition Account, $3,740.96. Thus in our total demand account there is available a sum of $28,622.17. We plan to put the above Fund Accounts to work for us during this year and their physical separation from the General Fund Demand Deposit will present a more understandable picture of this item.

Branch Activities

During the year two new branches received permanent charters, Houston and Dallas-Fort Worth. In March, the Executive Secretary spoke before a Kansas City group on the occasion of an organizational meeting and has been in touch with several people in Wichita for the same purpose.

The extent of Branch activities is re-

AUDITOR'S REPORT

April 21, 1952

The Supreme Society of
The American Electroplaters' Society, Inc.
Newark, N. J.

Gentlemen:

We have examined the balance sheets of the General Fund and Research Fund of the Supreme Society of The American Electroplaters' Society, Inc., as of March 31, 1952, and the related statements of Income and Expenses of said funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances, with the exception that we did not confirm the amounts due from dues of members at large and from sales of branch supplies.

The accompanying balance sheet and statement of income and expenses of the General Fund are exclusive of certain accounts as more fully described in Notes A and B attached thereto.

The Canadian Research Fund Balance Sheet as of March 31, 1952, and the related Statement of Income and Expenses for the fiscal year ended March 31, 1952, are attached as submitted by the Society, without audit thereof.

In our opinion, the accompanying balance sheets and statements of income and expense, except as indicated above, present fairly the financial position of The Supreme Society of The American Electroplaters' Society, Inc., as of March 31, 1952, and the income and expenses for the year then ended.

Very truly yours,

Laurence E. Brown Company
Certified Public Accountants

Philadelphia, Pa.

FINANCIAL STATEMENT OF THE SUPREME SOCIETY OF THE AMERICAN ELECTROPLATERS' SOCIETY, INC.

General Fund

BALANCE SHEET, MARCH 31, 1952

ASSETS		
Demand Deposit, Jenkintown Bank & Trust Company		$ 37,658 98
Petty Cash		40 00
Time Deposits:		
American National Building & Loan Association, Baltimore, Md.	$ 5,000 00	
Atlanta Federal Savings and Loan Association, Atlanta, Ga.	5,000 00	
Augusta Building & Loan Association, Baltimore, Md.	5,000 00	
Aurora Federal Savings and Loan Association, Baltimore, Md.	5,000 00	
Fidelity Federal Savings and Loan Association, Glendale, Calif.	5,000 00	
Home Building and Loan Association, Los Angeles, Calif.	5,000 00	
Occident Federal Savings and Loan Association, Baltimore, Md.	5,000 00	
Peoples Federal Savings and Loan Association, Detroit, Mich.	5,000 00	
Progress Federal Savings and Loan Association, Baltimore, Md.	5,000 00	
Standard Savings and Loan Association, Baltimore, Md.	5,000 00	
Standard Savings and Loan Association, Detroit, Mich.	5,000 00	
Suffolk County Federal Savings and Loan Association, Babylon, N. Y.	5,000 00	
Surety Savings and Loan Association, Detroit, Mich.	5,000 00	
		65,000 00

Accounts Receivable:		
Advertising, Subscriptions, Books and Reprints	$11,439 56	
Members at Large	860 44	
Branch Supplies	44 80	
		12,344 80
Advance to Industrial Finishing Exposition Committee		9,000 00
Deposit with Bell Telephone Company		200 00
Deposit with Copyright Office		34 00
Deposit with American Airlines		425 00
Total Assets (Note A)		$124,702 78

LIABILITIES AND FUND

Current Liabilities:		
Payroll Taxes	$ 543 28	
Advertising Advance Payments	1,843 11	
Foreign Advances	38 02	
Total Current Liabilities		$ 2,424 41
Unexpended Appropriations of Funds:		
Convention Account	$ 2,170 85	
Industrial Finishing Exposition Account	3,740 96	
Total Unexpended Appropriation		5,911 81
		3,125 00
Carl E. Heussner Award Fund		
General Fund:		
Balance, April 1, 1951	$84,257 89	
Add, Excess of Income over Expenditures for the fiscal year ended March 31, 1952, per statement attached:		
General Society Account (less) $ 9,652 01		
Publication Account 38,635 68	28,983 67	
Balance, March 31, 1952		113,241 56
Total Liabilities and Fund		$124,702 78

NOTE A: Exclusive of inventories of publications, literature and supplies, office furniture and equipment, accounts payable and prepaid and accrued expenses.

General Fund

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1952

SOCIETY ACCOUNT

INCOME		
Sales:		
"Proceedings"	$ 929 01	
Books and Reprints	1,679 83	
Glasstone Book	112 12	
Branch Supplies	72 80	$ 2,793 76
Per Capita Tax levied (Pro Rata share)		14,993 55
Foreign Membership Dues levied (Pro Rata share)		684 80
Interest on Savings Fund Accounts		1,803 03
Miscellaneous Income		268 51
Total Income		$20,543 65
EXPENSES		
"Proceedings" Expense		$ 5,400 21
Books and Reprints Purchased		1,290 45
Glasstone Book Royalty		9 30
Branch Supplies Purchased		92 05
Salaries (Pro Rata share)		15,403 07
Travelling Expense:		
Executive Secretary	$1,522 72	
Officers	1,866 30	3,389 02

flected in the number of Branch News Items published in PLATING. The number of such items this year was 267 or just about six items for each of the forty-six branches. In addition, seven photos were supplied by the Branches for reproduction in PLATING indicating greater interest and activity. A total of twelve announcements of special Branch meetings were published.

The Executive Secretary spoke before three branches during the year, briefly addressed ten others, and spoke to the officers of several others when in town on off-meeting nights. Next year, we hope to do better.

PUBLICATIONS

The print order for the April, 1952 issue of PLATING was 7,700 with the distribution being as follows:

Members:	
Active and Sustaining	5,941
Subscribers	1,059
Advertisers and Exchange	459
Inventory	241

The small decrease (36) in subscriptions during the year in the absence of any promotional activity indicates the increasing respect for PLATING as a magazine of value to electroplaters and metal finishers everywhere. Further testimony in this direction is the fact that 25 more pages of advertising were carried this year than in the previous year.

In the interest of efficiency, we are maintaining a production office in Philadelphia to insure the best service to our membership and advertisers in PLATING. Savings realized by not having to forward plates, etc., alone have justified the decision.

The PROCEEDINGS of the technical sessions of the 1951 Convention were distributed after the close of the fiscal year, due to the lateness of the Convention and several periods of illness of the Editor when he normally would have been busy on the PROCEEDINGS. Several papers presented to the Convention were promptly published in PLATING, and, on the basis of earlier precedent, these were not republished as part of the PROCEEDINGS. As a result, the total cost of the PROCEEDINGS, excepting editorial, was $1.29 per member and $1.25 per copy, including mailing costs. It should be mentioned that members in good standing as of August 31 of a given year, receive the PROCEEDINGS as part of their membership dues.

EDITORIAL BOARD

The Editorial Board continued to be very helpful with respect to the solicitation of papers for PLATING and for the Convention. As reported by Mr. Candee at the February Special Delegates' Meeting, there is a feeling that the Editorial

Board should be called upon to assist in the review of papers published in PLATING. Steps are being taken in this direction.

Both the Board members and the Companies they represent are indeed rendering the Society a great service. That the Board is willing to do more is heartening.

Headquarters

On December 1, 1951, the writer officially took over the duties of the Executive Secretary after a two-month period, during which Dr. A. K. Graham was most cooperative in helping to acquaint the new Secretary with the many details of the office. The Jenkintown staff, too, performed remarkably well in the face of a transfer of Headquarters from Jenkintown to Newark. This move was made the last day of this fiscal year and thus, should be a part of this report. We are proud of our new offices and facilities in the American Building at 445 Broad Street in Newark, and we already have indications that the more convenient location will result in frequent visits by Society members.

In conclusion, the sympathetic understanding of the Executive Board and the kind cooperation of the members of the Society is gratefully acknowledged.

D. GARDNER FOULKE

RESEARCH COMMITTEE CHAIRMAN'S REPORT

Price

The report of the Chairman of the Research Committee last year stated that there were eight active projects at that time. At present, there are still eight active projects although two of the old projects have been brought to a close and two new ones have been added. The locations of the active projects and the personnel of the Project Directing Sub-Committees are set forth in the table accompanying the present report.

From the date of last year's report through April, 1952, ten publications have appeared in PLATING covering A. E. S. research from Projects 2, 6, 7, 10, 11 and 12. At the Buffalo Convention last year the writer presented a comprehensive report covering the accomplishments of the active research projects up to that date. We shall not report in detail here on the work of the several projects since that time, as this will be done

Officers' Office Expense			55 11
Furniture and Fixtures and Office Equipment			705 28
Secretary's Office Expense (Pro Rata share)			2,461 63
New Educational Activities			1,389 04
Total Expenses (Note B)			30,195 66
Excess of Expenses Over Income Transferred to General Fund			$ 9,652 01

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1952

PUBLICATION ACCOUNT

INCOME			
Advertising		$124,263 45	
Less, Discounts allowed	$ 1,782 39		
Agency Commission	15,680 09	17,462 48	$106,800 97
Sales:			
Monthly Publication			4,924 12
Per Capita Tax levied (Pro Rata share)			11,127 62
Foreign Membership Dues levied (Pro Rata share)			410 88
Bad Debts collected			25 67
Total Income			$123,289 26
EXPENSES			
Commission, Advertising Manager			$ 10,505 47
Monthly Publication Expense			48,340 04
Salaries (Pro Rata share)			16,031 77
Travelling Expense, Advertising Manager			2,948 08
Travelling Expense, Editor and Assistant Editor			339 32
Copyright Expense			48 00
Uncollectible Accounts			234 83
Secretary's Office Expense (Pro Rata share)			6,206 07
Total Expenses (Note B)			$ 84,653 58
Excess of Income over Expenses transferred to General Fund			$ 38,635 68

SUMMARY

	Society Account	*Publication Account*	*Total*
Total Income	$20,543 65	$123,289 26	$143,832 91
Total Expenses	30,195 66	84,653 58	114,849 24
Excess transferred to General Fund	$ 9,652 01*	$ 38,635 68	$ 28,983 67

Less*

NOTE B: The expenses reported do not take into account the changes during the period in inventories of publication, literature and supplies, office furniture and equipment, accounts payable and prepaid and accrued expenses.

General Fund

STATEMENT OF RECEIPTS AND DISBURSEMENTS OF APPROPRIATED FUND ACCOUNTS FOR THE FISCAL YEAR ENDED MARCH 31, 1952

CONVENTION ACCOUNT

April 1, 1951, Unexpended Balance of Convention Profits appropriated from General Fund		$ 582 33
RECEIPTS		
Share of Profit, Buffalo Convention	$2,317 26	
Refund of Society Expenses, Buffalo Convention	939 71	
Total Receipts		3,256 97
		$ 3,839 30

DISBURSEMENTS

Buffalo Convention Expense:		
Printing and Mailing of Letters, Rate Schedules, etc.	$270 11	
Photographs and Cuts for magazines	124 90	
Postage for reservation data	179 10	
H. A. Barnes, Expense	130 14	
D. Gardner Foulke, Expense	27 00	$ 731 25
Los Angeles Convention Expense:		
Reimbursement to Los Angeles Branch for expenses incurred prior to cancellation of Convention	$935 64	
Postage	1 56	937 20
Total Disbursements		1,668 45
March 31, 1952, Unexpended Balance of Funds appropriated to Convention Account		$ 2,170 85

INDUSTRIAL FINISHING EXPOSITION ACCOUNT

April 1, 1951, Balance of Appropriation for Industrial Finishing Exposition transferred from General Fund	$ 4,552 37

RECEIPTS

None

DISBURSEMENTS

Miscellaneous Industrial Finishing Exposition Expenses	811 41
March 31, 1952, Unexpended Balance of Funds Appropriated to Industrial Finishing Exposition Account	$ 3,740 96

Research Fund

BALANCE SHEET, MARCH 31, 1952

ASSETS

Demand Deposit, Abington Bank and Trust Company		$ 6,836 55
United States Treasury 2% Bond due September 15, 1953		5,000 00
Time Deposits:		
Atlantic Federal Savings and Loan Association, Baltimore, Md.	$5,000 00	
Baltimore Federal Savings and Loan Association, Baltimore, Md.	5,000 00	
Liberty Federal Savings and Loan Association, Baltimore, Md.	5,000 00	
Loyola Federal Savings and Loan Association, Baltimore, Md.	5,000 00	20,000 00
Total Assets		$ 31,836 55

FUND

Research Fund:	
Balance, April 1, 1951	$ 41,419 31
Deduct, Excess of Expenses over Income for the year ended March 31, 1952 per attached statement	9,582 76
Balance, March 31, 1952	$ 31,836 55

in the Educational Session devoted to the Research Committee at the coming Chicago convention. Certain matters relating to the policy and administration will be discussed instead.

When the new officers took over the administration of your Research Committee following the sad death of Mr. Guy M. Cole, newly elected Chairman of the Committee, a certain amount of confusion was to be expected. It was several months before the loose ends could be properly gathered together and the Committee be made to function smoothly. Upon first taking over, your officers felt considerable concern regarding the finances of the Research Committee. During the preceding year, our expenditures had run in the neighborhood of $40,000, whereas our collections had been little more than $30,000. However, the situation was not so bad as these figures seem to indicate, inasmuch as we had a substantial reserve of accumulated funds. Nevertheless, it was felt that the most urgent task in hand was to correct this situation and, insofar as possible, to wipe out the deficit.

The Research Committee did not wish to bring its budget into balance at the expense of profitable research projects which were turning out work of value to the Society. However, it so happened that Projects 9 and 11 had come to a logical stopping point and could be discontinued.

In spite of these and other economies effected, it was only possible to save a modest sum during the present fiscal year due to the fact that the new officers took over in the middle of the fiscal year. However, during the coming fiscal year, we shall be operating within our budget and may even be able to accumulate a surplus to be used for new projects.

The Research Committee has adopted a definite procedure for setting up new projects. This implies no criticism of the method of setting up new projects in the past, but simply formalizes a procedure which has been occasionally used very successfully. The procedure consists of first appointing what may be called a "Task Committee" to study the project from the standpoint of its value to the Society as a whole and its practicability. It is also the function of this Task Committee to define and limit the scope of the project, to suggest methods of attack, and also a suitable location and Project Director.

The members of the Task Committees are to be experts in the particular field under consideration preferably not members of the Research Committee, and need not necessarily be members of the American Electroplaters' Society. The purpose is to get expert advice on the value of the project and the endorsement of experts in the field. When this Task Com-

mittee has made its report, the Research Committee will then consider the question of setting up the project.

Some months ago, a list of all the projects which had been suggested to the Research Committee over a number of years past was drawn up. At the last meeting of the Research Committee, this list was given careful consideration. Certain projects were selected from this list by vote of the Committee. Chairmen have been appointed for three Task Committees to consider three of these projects. These Chairmen will in turn appoint their own committees with the advice and consent of the Research Committee.

It should be pointed out that it is far from a simple matter to set up a new A. E. S. Research Project. There are only a limited number of universities and institutions having men competent to direct such projects. There are relatively few competent scientific men with a good background in electroplating. Another difficulty arises from the present-day scarcity of research students. Of such students that are available only a limited number have an interest in the electroplating field.

The Finance Sub-Committee has done a splendid job under the leadership of Chairman Clyde Kelly and Co-Chairman Ray Ledford. Subscriptions are coming in satisfactorily and it is our hope that we will do better financially this year than we did last.

DONALD PRICE

LAW COMMITTEE CHAIRMAN'S REPORT

Glover

The Law Committee during the year has received the proposed By-Laws of the Southeastern Branch and the revision to the By-Laws of the Dayton Branch bringing to 21 the number of Branch Codes passed upon by this Committee.

The Chairman attended the Annual Meeting in Buffalo and the Interim Meeting in Philadelphia and worked with the Executive Board in the preparation of resolutions and amendments offered for action in connection with both.

MANSON GLOVER

Research Fund

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1952

INCOME		
Sustaining Membership Dues and Subscriptions	$31,418 00	
Sale of Reprints	260 30	
Interest on Saving Fund Accounts	707 38	
Interest on U. S. Treasury Bond	100 00	
Total Income		$ 32,485 68
EXPENSES		
Transfer to Canadian Research Fund	$ 2,000 00	
Salaries of Project Directors and Associates	27,614 20	
Project Payments to Institutions	7,125 00	
Cost of Reprints	584 92	
Supplies	372 99	
Office Expense	21 50	
Per Capita Tax, Sustaining Members paid to General Fund	1,254 90	
Social Security Tax	194 05	
Travel Expenses	302 20	
Bad Debts	8 61	
Miscellaneous Expense	2,390 07	
Total Expenses		42,068 44
Excess of Expenses over Income		$ 9,582 76

Canadian Research Fund

BALANCE SHEET, MARCH 31, 1952, IN CANADIAN DOLLARS

ASSETS		
Cash, Dominion Bank, Toronto, Canada		$ 149 69
FUND		
Canadian Research Fund:		
Excess of Income over Expenses for the year ended March 31, 1952, per attached statement		$ 149 69
Balance, March 31, 1952		$ 149 69

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1952, IN CANADIAN DOLLARS

INCOME		
Sustaining Membership Dues and Subscriptions	$ 2,552 13	
Transferred from American Electroplaters' Society Research Fund (Includes $97.50 income from exchange)	2,097 50	
Interest on bank account	06	
Total Income		$ 4,649 69
EXPENSES		
Project Payments to Institutions:		
Ontario Research Foundation		4,500 00
Excess of Income over Expenses		$ 149 69

NOTE: The Canadian Research Fund accounts are presented, as accepted from the Society, without audit thereof.

RESEARCH COMMITTEE, 1951-1952

Dr. Donald Price, *Chairman*
Oakite Products, Inc.

W. L. Pinner, *Vice-Chairman, Research*
Hanhille-Hershey Corporation

Clyde Kelly, *Vice-Chairman, Finance*
R. Merrell & Sons Plating Company

W. A. LaLande, Jr.
Penn-Salt Chemicals Corporation

J. Teres
Wright-Patterson AAF Base

R. C. Case
Hanson-Van Winkle-Munning Co.

R. F. Ledford
Sunbeam Corporation

G. W. Jernstedt
Westinghouse Electric Company

C. H. Sample
The International Nickel Company

Ex Officio Members

C. E. Nixon
A. E. S. President

Dr. D. G. Foulke
A. E. S. Executive Secretary

Honorary Member

Dr. William Blum, National Bureau of Standards

Liaison Members

C. H. Sample
Representing A.S.T.M. Comm. B-8
The International Nickel Co., Inc.

G. E. Best
Representing A.S.T.M. Comm. D-12
Mutual Chemical Co. of America

FINANCE SUB-COMMITTEE

Clyde Kelly, *Chairman*
R. Merrell & Sons Plating Company

R. F. Ledford, *Co-Chairman*
Sunbeam Corporation

District Captains

Dr. H. L. Kellner
New England Branches

Gene Combs
Ohio State Branches

Milton Nadel
New York and Newark Branches

Robert J. Racine
Michigan State Branches

Fred Fulbarth
Baltimore-Washington and Southeastern Branches

John Lockerbie
St. Joseph Valley, Indianapolis and Louisville Branches

G. W. Cavanaugh
Upstate New York Branches

Raymond Kotz
Rockford, Twin Cities and Milwaukee Branches

Arthur Weisberg
St. Louis, Dallas, Houston, Los Angeles and San Francisco Branches

RESEARCH DIRECTING SUB-COMMITTEE

W. L. Pinner, *Chairman*
Hanhille-Hershey Corporation

G. W. Jernstedt, *Research Supervisor*
Westinghouse Electric Corp.

Dr. R. A. Schaefer, *Research Supervisor*
Cleveland Graphite Bronze Co.

C. H. Sample, *Research Supervisor*
The International Nickel Co., Inc.

SUSTAINING MEMBERSHIP LIST

As of May 1, 1952

(Figures in parenthesis indicate number of memberships held)

Accurate Electro-Plating, Inc.
Accurate Engineering Laboratories
Acme Galvanizing, Inc.
Acme Plating Company, The
Acme Steel Company
Adolph Plating, Inc.
Advance Plating Company, The
Aetna Electroplating Company
Allen-Bradley Company
Allied Industrial Products, Inc.
Allied Research Products, Inc.
Alsop Engineering Corporation
Aluminum Company of America
American Buff Company
American Cabinet Hardware Corporation
American Can Company
American Chemical Paint Company
American Fixture & Manufacturing Company
American Flange & Manufacturing Company
American Hot Dip Galvanizers Association, Inc.
American Instrument Company
American Nickeloid Company
American Radiator & Standard Sanitary Corporation
American Smelting & Refining Company
American Wire Fabrics Corporation
American Zinc Institute (5)
Apex Plating Company
Apollo Metal Works
Apothecaries Hall Company
Ardco, Incorporated
Armco Steel Corporation
Arrow-Hart & Hegeman Electric Company
Arrow Plating Company, Inc.
Arvin Industries, Inc.
Auto City Plating Company
Autoyre Company, Inc.
Automotive Rubber Company

M. E. Baker Company
Baker Bros., Inc.
Bastian-Blessing Company, The
Beacon Supply Company
Belke Manufacturing Company
Bell & Howell Company
Bell Telephone Laboratories, Inc.
Bendix Products Division, Bendix Aviation Corporation
Bertsch-Lowell Plating Works
Bethlehem Steel Company (2)
Blakeslee, G. S. & Company
Briggs Manufacturing Company
Brookline Electro Platers, Inc.
Bruce Products Corporation
Buckeye Products Company, The
Buckingham Products Company (2)

Chase Brass & Copper Company
Chemical Corporation, The
Chicago Electro-Platers Institute
Chicago Roller Skate Company
Chicago Thrift-Etching Corporation

Christie Plating Company
Chrome-Rite Company (2)
Chromium Corporation of America
Chromium Process Company, The
Chrysler Corporation (2)
Cinch Manufacturing Corporation
Clayton Mark & Company
Cleveland Graphite Bronze Company, The
Clinton Company, The
Clinton Supply Company, Inc.
Codman, F. L. & J. C., Company
Corona Corporation
Cowles Chemical Company
Crane Company
Crosamo, Incorporated
Crown City Plating Company
Crown Cork & Seal Company
Crown Rheostat & Supply Company

Darco Dept., Atlas Powder Company
Davies Supply & Manufacturing Company
Daystrom Corporation
Detroit Plating Industries
Diamond Alkali Company
Donald Sales & Mfg. Company
Diversey Corporation, The
Dixie Electro Plating Company
Doehler-Jarvis Corporation (2)
R. R. Donnelley & Sons Company
E. I. duPont de Nemours & Company
Dura Div., Detroit Harvester Company
Dura-Chrome of Chicago, Inc.

Eastman Kodak Company (2)
Eaton Manufacturing Company
Ekco Products Company
Electric Auto-Lite Company, The (2)
Electro Coatings, Inc.
Electrolux Corporation
Ellmore Silver Company, The
Enthone, Inc.
Erie Plating Company

Felt & Tarrant Manufacturing Company
Finishing Publications, Inc.
Ford Motor Company (5)
Formax Manufacturing Company
Fox Products Company
Frigidaire Division, General Motors Corporation

Gemex Company
General Electric Company
General Motors Corporation (5)
Gerity-Michigan Corporation
Gorham Manufacturing Company
Graham, Crowley & Associates, Inc.
Graham Plating Works
Grand Rapids Plating Company
Grand Plating Company
Great Lakes Plating Division
Frederick Gumm Chemical Company

C. Hager & Sons Hinge Manufacturing Company
Hall-Mack Company
Hamilton Watch Company
Hammond Machinery Builders, Inc.
Hanson-Van Winkle-Munning Co. (3)
Harding Manufacturing Company
Hardwood Line Manufacturing Company
Harshaw Chemical Company, The (3)
Haviland Products Company
Heil Process Equipment Corporation

RESEARCH PROJECTS

Project No.	Location	Project Director	Project Directing Sub-Committee	Year Accepted
2	Lehigh University	Prof. E. J. Serfass	Dr. Walter E. Meyer, Chairman, Enthone, Inc. R. A. Ehrhardt, Bell Telephone Laboratories, Inc. George E. Best, Mutual Chemical Company of America	1944
5	Michigan State College	Prof. D. J. Ewing	Leslie Borchert, Chairman, Hoodaille-Hershey Corporation Joseph Gurski, Ford Motor Company L. Morse, Chrysler Corporation	1945
6	Princeton University	Dr. N. Thon	Dr. I. Weisberg, Chairman, Consultant Dr. B. Egeiberg, International Silver Company Clifford Struyk, General Chemical Div., Allied Chemical & Dye Corp.	1946
10	Yale University	Prof. B. F. Dodge	H. B. Smith, Chairman, R. Wallace & Sons Manufacturing Company L. A. Dame, General Motors Corp. F. J. Holt, E. I. duPont de Nemours & Company	1947
12	Columbia University	Prof. H. B. Linford	E. T. Candee, Chairman, Lea Manufacturing Company Dr. W. A. LaLande, Pennsylvania Salt Manufacturing Company Dr. Edward Parker, Technic, Inc.	1948
13	National Bureau of Standards	Fielding Ogburn	C. H. Sample, Chairman, The International Nickel Company Dr. W. Blum A. Mendizza, Bell Telephone Laboratories, Inc.	1950
14	Ontario Research Foundation	Dr. A. E. R. Westman	Dr. W. M. Tucker, Chairman, Eastman Kodak Company W. G. Finlay, The M & T Products Company Charles Hubbesday, Canada Cycle & Motor Company Leonard Wray, Bonnar Electrotype Company, Ltd.	1951
15			C. F. Nixon, Chairman, General Motors Corporation	1952

Members of Project Directing Sub-Committee and Project Director to be selected.

Heywood-Wakefield Company
Houdaille-Hershey Corporation (3)
Howard Plating Industries, Inc.
Howell Company, The
Hub Plating Works
Hudson Motor Car Company
R. O. Hull & Company, Inc.
Hy-Grade Electroplating Company

Illinois Watch Case Company
Industrial Filter & Pump Manufacturing Company
International Business Machines Corporation
International Nickel Co., Inc., The (5)
International Silver Company

Jones & Laughlin Steel Corporation

Kaynide Div., Kraft Chemical Co.
Keeler Brass Company
Kelite Products, Inc.
Kelly Plating Company, The
Knape & Vogt Manufacturing Company
Knight-Morley Corporation
Knight Plating Company
Koppur Company
Kohler Company
Kuehne Manufacturing Company

Lasalco, Inc.
Lea Manufacturing Company, The
Leeds & Northrup Company
Chas. F. L'Hommedieu & Sons Company
A. J. Lynch & Company
Lyon, Incorporated

Maas & Waldstein Company
W. D. MacDermid Chemical Company
MacDermid, Incorporated
Magnuson Products Corporation
R. C. Mahoney
P. R. Mallory & Company, Inc.
Manderscheid Company, The
Matchless Metal Polish Company, The

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1—6000 AMPERE, 2-6 VOLT, **JANTZ & LEIST.**
1—6000-9000 AMPERE, 6-12 VOLT, **BOGUE.**
1—5000-7500 AMPERE, 6-12 VOLT, **EAGER.**
1—3000-4500 AMPERE, 6-12 VOLT, **HANSON-VAN WINKLE MUNNING CO.**
1—2500-3750 AMPERE, 6-12 VOLT, **HANSON-VAN WINKLE MUNNING CO.**
1—2000-3000 AMPERE, 6-12 VOLT, **MUNNING** "OPTIMUS."
1—1500-2250 AMPERE, 6-12 VOLT, **HANSON-VAN WINKLE MUNNING CO.**
1—1500-2250 AMPERE, 6-12 VOLT, **CHANDEYSSON.**
1—1000-3000 AMPERE, 6-12 VOLT, **CHANDEYSSON.**

ANODIZERS

2—1000 AMPERE, 40 VOLT, **IDEAL**, Exciter-in-head.
1—1000 AMPERE, 40 VOLT, **CHANDEYSSON**, 25° C.
1—500 AMPERE, 40 VOLT, **M. G. C.** Exciter-in-head.
1—400 AMPERE, 40 VOLT, **M. G. C.** Exciter-in-head.
1—300 AMPERE, 25 VOLT, **CHANDEYSSON**, 25° C.

RECTIFIERS

1—2000 AMPERE, 6 VOLT, **G. E.** COPPER OXIDE RECTIFIER.
1—**GREEN SELECTROPLATER**, 1800 AMPERE, 12 VOLT.
2—**UDYLITE MALLORY**, 1440-720 AMPERE, 6-12 VOLT.

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1—**CROWN** 18 x 18 CENTRIFUGAL DRYER.
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6—24" **ROBBINS & MYERS** 2-SPEED VENTILATING FANS.
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1—**CROWN** 5-COMPARTMENT HORIZONTAL TUMBLING BARREL.

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Meaker Company, The
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Mercil Plating Equipment Company
B. Mercil & Sons Plating Company
Metal Mouldings Corporation
Metal Processing Company
Michigan Bumper Corporation
Michigan Chrome & Chemical Company
Midwest Chrome Process Company
J. C. Miller Company
Minneapolis-Honeywell Regulator Co.
Mitchell-Bradford Chemical Co., The
Modern Plating Company
Modern Plating Company, The
Modern Plating Corporation
Moore Drop Forging Company
Motor Products Corporation
Mutual Chemical Company of America

George L. Nankervis Company
National Aniline Division, Allied Chemical & Dye Corporation
National Brass Company
National Cash Register Company, The
National Lock Company
National Plating Company, Inc., The
National Screw and Manufacturing Company, The
Nelson Chemicals Corporation
New England Buff Company
New England Plating Company, Inc.
New Jersey Zinc Company (3)
George E. Nichols Plating
G. J. Nicholas & Company, Inc.
Northwest Chemical Company
Northwestern Plating Works
Nutmeg Chrome Corporation

Oakite Products, Inc. (2)
Oneida, Ltd.

Packard Motor Car Company
Parker Rust Proof Company
Pennsylvania Salt Manufacturing Company, The
Petrina-Line Rubber Products Corporation
Pheoll Manufacturing Company
Philadelphia Rust-Proof Company
Philco Corporation
Platers Supply Company
Plating Service Company
Precision Castings Company, Inc.
Price-Pfister Brass Manufacturing Co.
Products Finishing
Promat Division, Pyor & Company

R. C. A. Victor Division, Radio Corporation of America
Reilly Plating Company
R. W. Renton & Company
Reynolds-Robson Supply Company (2)
Richardson-Allen Corporation
Roberts Rouge Company
G. S. Robins & Company
Roto-Finish Company
Royal Plating & Polishing Company, Inc.

Sargent & Company
Scientific Control Laboratories
Scovill Manufacturing Company
J. P. Seaburg Corporation
E. E. Seeley Company, Inc.
Seymour Mfg. Company
J. J. Siefen Company
Sparkler Manufacturing Company
Standard Plating Rack Company
Standard Plating Works
Standard Steel Spring Company (3)
Stanley Works, The
Stevens, Frederic B., Inc.
Studebaker Corporation, The
George A. Stutz Manufacturing Company
Sunbeam Corporation
Superior Steel Company
Surface Alloys, Inc.
Sylvania Electric Products, Inc.

Talon, Inc.
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Answers to your questions . . . suggestions for improving techniques

CLOSE CHEMICAL CONTROL of the plating bath is extremely important in maintaining high-quality plating performance. The questions below reflect the interest of platers in correcting or improving bath formulations—typical questions from letters written to Du Pont. Perhaps the answer to *your* plating problem is printed here. If not, write directly to Du Pont Plating Service, Electrochemicals Department, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

Q. How can I convert from a sodium "Coppralyte" bath to a potassium "Coppralyte" bath?

A. Conversion from the sodium to potassium bath may be easily accomplished without interruption of plating operations. Using the same equipment, you can change over the "Coppralyte" bath by gradually increasing the potassium content. No complicated analyses for sodium or potassium are required during the transition. Here are the steps to be followed:

1. Increase potassium content by additions of "Coppralyte" plating salt-potassium formulation, potassium cyanide and potassium hydroxide. 2. Check the bath frequently with Hull Cell plating tests during these additions. 3. Hold the "free" cyanide at 1.5 oz. gal., calculated as potassium cyanide.

Q. What is the effect of lead, cadmium and copper impurities in a "Zin-O-Lyte" or "Durobrite" zinc plating bath and how can these impurities be removed?

A. Lead or cadmium contamination usually produces dark deposits which tarnish or stain very readily on handling or standing. Bright, lustrous deposits may be produced in the presence of copper, but these deposits discolor badly upon ageing—usually to a bluish or gun-metal color. Copper may be detected in the bath by "bright dipping" deposits in 0.25% nitric acid solution. *Generally, when bright dipping does not improve an unsatisfactory deposit, metal impurities are present.*

The best method of purifying contaminated solutions is by using high purity zinc dust, sodium polysulfide, or both. Low current density electrolysis at 2-5 A SF may be used for purification, but this method may require several hours.

Q. We have a small shop and are not equipped to analyze our "Coppralyte" copper plating bath. Please tell us how to make occasional control checks on the bath without elaborate equipment.

A. Chemical analysis and the use of the Hull Cell are strongly urged for the proper operation of a copper plating bath. However, if these facilities are not available, the following tests may be helpful:

1. Check temperature. Low bath temperature can cause nonuniform and mottled deposits—even from a bath in good chemical balance. 2. Add 0.1 oz. gal. "Coppralyte" Addition Agent 1085 to the plating bath or a portion of the bath. If organic contamination is present, there should be a reduction in nonuniformity of deposit. 3. Check approximate "free" cyanide by immersing a *clean* zinc die casting in the bath for 15 seconds. If the casting becomes copper colored, "free" cyanide is too low. If it becomes brass colored, "free" cyanide is in a safe working range. Close comparison of the work with the current being used is a further visual check.

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Article Abstracts

No copies of articles are available at the offices of "Plating". Photostats may be had from libraries having files of the journal in question and offering photostat service, usually at 30-50 cents a page. Ask your public library to consult the Union List for names of libraries having the particular journal. Abbreviations used are those of Chemical Abstracts.

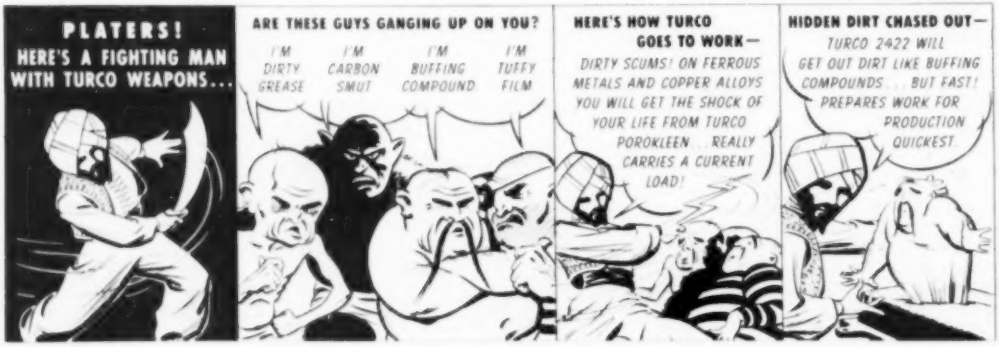
Diffusion of Hydrogen in Steel with Different Carbon Contents During Acid Pickling. S. A. Balezin and D. Ya. Solovei. Doklady Akademii Nauk, S.S.S.R., 75, No. 6, 811-814 (1951). Transl. No. 2667 by H. Brutcher, Altadena, Calif.

With 0.11-1.20 carbon steel, both diffusion and evolution of hydrogen, at 75° F, are higher in 5-N than in 1-N sulfuric acid, but the ratio stays fairly constant at 0.03-0.10 throughout the range. Both processes reach a maximum at 0.90 per cent carbon. In hydrochloric acid, metal dissolution also increases linearly with concentration from 1.0-N to 5.0-N, but diffusion decreases, and the aforesaid ratio drops from 0.20 to 0.02.

Among inhibitors tried in sulfuric acid, thiodiglycol retards both processes about equally; diethylene reduces dissolution of steel to one-third but diffusion to 0.03-0.10, and the aforesaid ratio is 0.02-0.03; thiourea reduces dissolution to 0.03-0.10 but diffusion only to 0.6-0.7; with hydrogen sulfide 10 per cent of the hydrogen diffuses through high-carbon steel. Other results are listed.

Laminated Aluminum Finish Replaces Nickel-Chrome. W. A. Bartski. Ind. Finishing 27, 44-47 (August, 1951).

A smooth, grain-free, finish similar to satin-finished chromium is obtained by spraying, at 25-psi pressure, with (1) alkali cleaner (9 g/l) at 160° F; (2) water at 140° F; (3) rust-proofing solution at 160° F; (4) cold water; (5) mild chromic acid solution at 140° F; then (6) passing the parts through a gas-fired drying oven; (7) spraying at 85-psi atomizing pressure and 15-psi fluid pressure with a synthetic gloss primer (containing 7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per cent zinc chromate for added protection) of a 24-sec viscosity at 78° F in a No. 4 Ford cup; (8) after 15 sec, spraying a slurry of 1 pt aluminum paste to 11 pt xylol, having an 11.5 sec viscosity at 78° F in a No. 4 Ford cup, at 65-psi atomizing pressure and 7-psi fluid pressure; (9) baking the two coats in a gas-fired convection oven for 27 min at 293° F; (10) cooling for 12 min; (11) spraying a clear synthetic of 18-sec viscosity at 78° F in a No. 4 Ford cup; (12) air drying for 6 min; (13) same as (9). Salt-spray resistance is 250–400 hours.

Chemical Removal of Copper from Boilers. R. C. Call and W. L. Webb. Trans. Am. Soc. Mech. Engs. **73**, 125–133 (February, 1951).

When a 1,000,000-lb per hr boiler was acid-cleaned for removal of deposits, which were predominantly iron oxide, the boiler metal was heavily plated with copper. During subsequent operation this copper became detached in large sheets which affected circulation adversely, making copper removal mandatory. A solvent was developed containing $(NH_4)_2S_2O_8$, NH_4OH, and NaOH which removed about 300 lb of copper. Procedures, results, and costs are indicated.

Aluminum Cleaning. Part I. D. F. Seymour. Die Castings **9**, 37–40, 59–62 (February, 1951).

Reviews methods and equipment for the above, especially as applied to diecast parts.

Electrodeposition of Rhenium-Nickel Alloys. L. E. Netherton and M. L. Holt. J. Electrochem. Soc. **98**, 106–109 (March, 1951).

Above process, from an ammoniacal citrate bath and from nickel-plating baths containing potassium perrhenate is described. The ammoniacal citrate bath was used to determine effects of such factors as bath composition, bath pH, bath temperature, and current density on cathode current efficiency and alloy composition. Some of the properties of electrodeposited Re-Ni alloys are also reported.

The Relationship Between Orientation, Grain Size, and Brightness in Nickel Electrodeposits.

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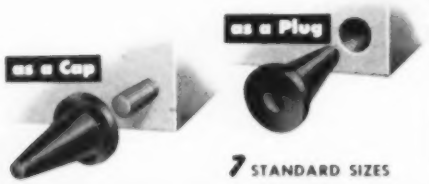

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G. L. Clark and S. H. Simonsen. J. Electrochem. Soc. **98**, 110–115 (March, 1951).

A large number of panels with nickel electrodeposited under varied conditions were examined by improved X-ray diffraction techniques. Orientation and grain size were evaluated in order to determine whether or not any correlation exists between these characteristics and the fundamental optical property of brightness. X-ray grain sizes of matte, semibright, and bright deposits were found to be of the same order of magnitude. No correlation was found between orientation and brightness. 25 ref.

Antimony Plate. Adolph Bregman. Metal Progress **59**, 215–217 (February, 1951).

Points out that pure antimony resists attack by hydrochloric and hydrofluoric acids, is relatively tarnish resistant, and is easily buffed to a highly reflective surface. Outlines successful plating techniques which make it a substitute for the more critical metals nickel and chromium.

Electroforming for Plastics. Anon. Modern Plastics **28**, 81–84, 86–87, 90 (March, 1951).

Tells how spray masks and specialized molds for plastics products are accurately produced by electroplating copper shells over prepared matrices. Illustrated.

A Note on Thin Nickel Foils. Stanley Bashkin and Gerson Goldhaber. Rev. Sci. Instruments **22**, 112–113 (February, 1951).

Describes preparation by electrodeposition of nickel foils down to 250-A thick, for experimental use.

Throwing Power in Alloy Deposition. J. W. Cuthbertson. J. Electrodepositors' Tech. Soc. **25**, 81–83, 90–94 (1950).

Discusses the fact that it is possible to have reasonably good throwing power with respect to thickness associated with a poorer throwing power with respect to composition, and *vice versa*. Deposition of tin-copper speculum in a bright form from a speculum electrolyte modified by certain addition agents is cited as an example.

Plant Observations on a Potassium Cyanide Copper Bath. W. Savelsberg. Metalloberflaeche **3**, Ser. B, 4–6 (January, 1951).

Causes of formation of pores and bubbles in copper electrodeposits were investigated. Deposition potentials of different electrolytes were measured. Data are graphed.

Examination of Plated and Protective Coatings by Electrographic Analysis. N. Galitzine and S. E. O. Ashley. American Society for Testing Materials, "Symposium on Rapid Methods for the Identification of Metals" (1950), pp. 61–68.

USE READER SERVICE CARD. INDICATE A 797.

Article Abstracts

Describes application of the above to study of plated or coated surfaces, and examination of them for holes. Detailed description and several photographs of the apparatus, as well as electrographic prints, are included.

Hydrogen Overvoltage and Potential Build-Up at Copper Cathodes. A. K. Wiebe, W. Gauvin, and C. A. Winkler. Can. J. Chem. **29**, 301–307 (April, 1951).

Experiments on the photoelectric effect in relation to absorption of gases on the metal surface indicate the soundness of the belief that an adsorbed film of hydrogen is responsible for hydrogen overvoltage. 20 ref.

A Method for Determining the Cathodic Distribution of Current and Metal in Galvanic Electrolytes. Julius Steiner. Arch. tech. Messen (January 1, 1951). 4 p.

Describes and diagrams new method for determining the distribution of metal on the cathode and criticizes earlier methods. Data are tabulated and charted.

Improved Finishing Machine for Zinc Base Die Castings. Anon. Automotive Ind. **104**, 58 (May 1, 1951).

Describes and illustrates "Gyro-Finisher", a new abrasive tumbling machine developed by Ternstedt Division, General Motors Corporation.

Notes on the Production of Aluminum Reflector Surfaces. Electroplating and Metal Finishing **4**, 121–122 (April, 1951).

Discusses materials, mechanical polishing, degreasing and cleaning, electrolytic brightening, and rinsing.

Chemical Coloring (Patina Formation) on Metallic Artistic and Useful Articles. H. Krause. Metalloberflaeche **3**, Ser. B, 1–3 (January, 1951); 22–24 (February, 1951).

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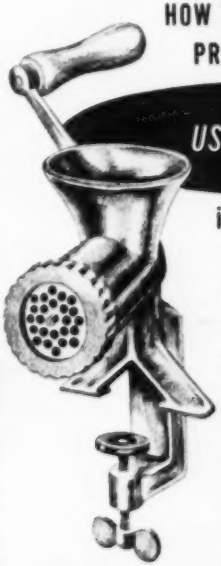

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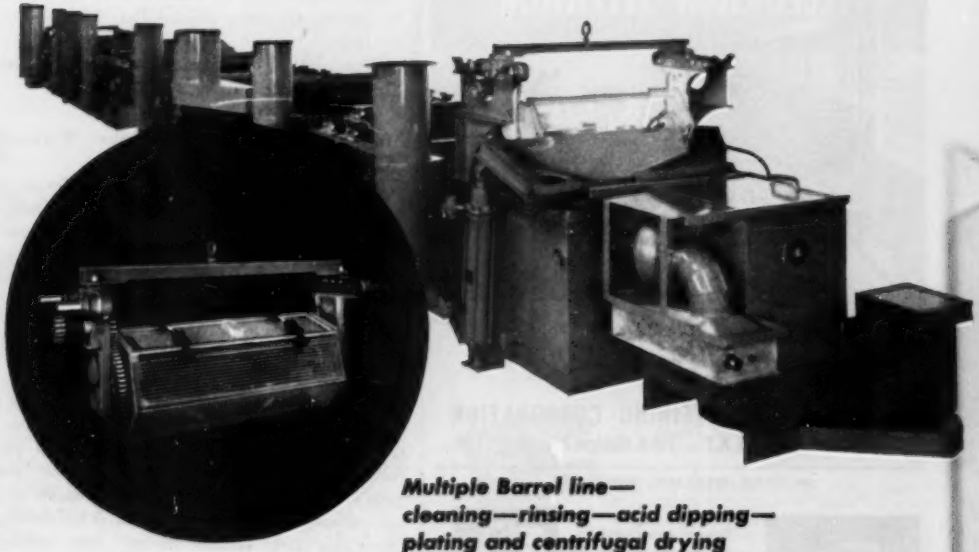

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Article Abstracts

Discusses the various types of patina which form naturally on copper and its alloys in different atmospheres. Second installment contains suggestions for testing of specific metals and alloys for ability or tendency to form a patina.

Nickel Deposition in Tube Bores. A. W. Hothersall and G. E. Gardam. Metal Ind. **78**, 308-311 (April 20, 1951).

Gives details of process developed for the above. Tubes are mild steel.

Materials and Soils. L. W. Haase. Werkstoffe Korrosion **2**, 90-93 (March, 1951).

Discusses the corrosive effects of different types of soil on iron, copper, zinc, lead, and their alloys; also the chemical effects of soils on cement, asbestos cement, concrete, ceramics, and wood. Includes diagrams and photographs.

Metal Recovery by Cation Exchange. A. B. Mindler, M. E. Gilwood, and G. H. Saunders. Ind. Eng. Chem. **43**, 1079-1081 (May, 1951).

Reports two unique processes for recovery of tin and zinc from solutions. This work was undertaken to contribute to the solution of waste-disposal problems, conservation of strategic metals, water, and heat values. Results indicate that it is possible to employ ion exchange for recovery of tin from electroplating operations using alkaline baths. Also outlines some preliminary data on removing and recovering zinc from relatively concentrated sulfuric acid solutions.

The Effect of Ultrasonic Frequencies on Electrolytic Processes. II. The Stirring Effect of Ultrasonics. Albert Roll. Z. Metallkunde **41**, 413-417 (November, 1950).

Presents results of quantitative experimental study of the above for electrolytic separation of silver and of copper. Data are charted.

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- ¶ Which costs more: good electrocleaning or poor electrocleaning? *See page 4.*
- ¶ How can cleaning costs be reduced 33% while plating quality is being improved? *See pages 7 and 8.*
- ¶ What are four easy ways to improve the average rinse tank? *See page 10.*
- ¶ What rinsing fault is "an invitation to trouble" in the plating of high-carbon steel? *See page 11.*
- ¶ Why is it better to clean steel with reverse current than with direct current? *See pages 12 to 14.*
- ¶ What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*
- ¶ One part chromic acid in 1,000,000 parts of cleaning solution—does that spell D-A-N-G-E-R? *See page 16.*
- ¶ How can an ordinary electrocleaning cycle be transformed into an exceptionally good cycle? *See Cycle E on page 23.*

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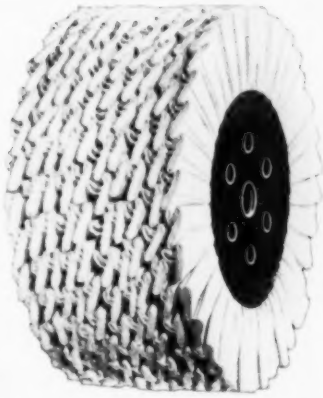

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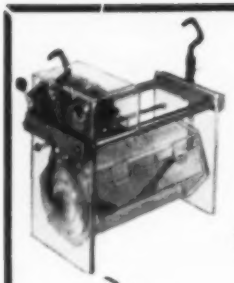

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Patent Abstracts

GEORGE B. HOGABOOM
Consultant, New Britain, Conn.

Copies of patents may be obtained by writing to Commissioner of Patents, Washington 25, D.C. Price 25 cents each.

No. 2,583,098, January 22, 1952—Treatment of Waste Pickle Liquor—G. W. Heise, E. A. Schumacher and H. R. Wilson, assignors by mesne assignments to Union Carbide and Carbon Corporation.

CLAIM 1. Method of treating an acidic iron pickle liquor containing a pickling inhibitor which comprises removing the pickling inhibitor from the liquor, passing this liquor into an electrolytic cell having a cathode upon which iron can plate and a porous anode, and electrolyzing in said cell at a temperature up to 40° C. such a liquor containing at least sufficient mineral acid to give a *p*H corresponding to 6 grams of sulfuric acid per liter, plating iron from said liquor onto the cathode, passing the liquor through the anode, oxidizing only a portion of the ferrous iron in the liquor at the anode from the ferrous to the ferric state, withdrawing from the cell an effluent which is the pickle liquor after it has passed through the anode and contains ferrous ions but is enriched in ferric ions, and maintaining the anodic current density below that at which gas is released at the anode.

18 claims, 3 figures.

References cited: U. S. Patents 788,064; 987,318; 1,006,836; 1,007,388; 1,362,745; 1,980,381; 2,273,036; 2,367,811; 2,389,691; 2,418,970; 2,419,240. Trans. Am. Electrochem. Soc. 29, 359 (1916).

No. 2,583,099, January 22, 1952—Pre-electrolysis Treatment of Pickle Liquor—John P. Oliver, assignor by mesne assignments to Union Carbide and Carbon Corp.

CLAIM 3. In the electrolytic recovery of iron from waste pickle liquor resulting from the commercial acid pickling of iron in the presence of a pickling inhibitor, the step comprising electrodepositing iron on a cathode contacting an electrolyte, the electrolyte comprising the waste pickle liquor providing iron ions in aqueous solution for deposition by electrolysis and also comprising the reaction products of said pickling inhibitor and a member of the group consisting of nitrous acid, its salts and anhydride, the amount of reaction products, corresponding, at least, to substantially complete reaction of the inhibitor, the inhibitor being a material containing an element of groups 5 and 6 of the periodic table capable of forming an onium compound.

7 claims, 1 example.

References cited: U. S. Patents 526,114; 850,912; 1,695,430; 1,922,853; 2,054,282; 2,147,149; 2,306,171; 2,389,691. British Patent 359,903. Holleman, "Textbook of Organic Chemistry", edited by Jamieson and Walker, 5th ed. (1920).

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Patent Abstracts

No. 2,583,100, January 22, 1952—Treatment of Metallic Cathode to Receive Electrodeposited Metal—H. R. Wilson, assignor by mesne assignments to Union Carbide and Carbon Corporation.

CLAIM 1. In the art of winning iron from an aqueous solution of an iron salt onto an iron cathode, the method of conditioning the cathode prior to deposition of the iron which comprises subjecting the cathode to the action of aqueous nitric acid only until brown fumes appear from the cathode surface and the surface is given an evenly etched matte finish and presents a dark film, and then preventing further action of the acid, the surface being free of such distinct crystalline etch as to be visible to the naked eye and the amount of treatment corresponding to the immersion of the cathode in an aqueous 5 to 15 per cent nitric acid solution for from 10 to 25 seconds.

2 claims.

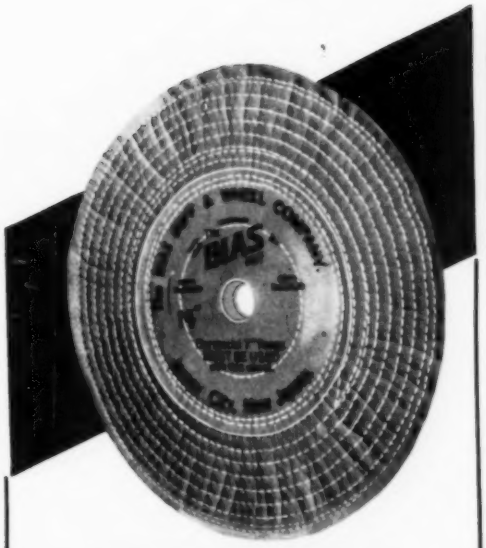
References cited: U. S. Patents 454,381; 1,945,107; 2,044,742; 2,223,928; 2,314,915; 2,374,356; 2,411,532; 2,480,156. British Patent 405,902.

No. 2,583,581, January 29, 1952—Metal Coating—Hiram S. Lukens, assignor to United States of America as represented by the Secretary of War.

This invention relates to metal coating, and more particularly to the application of an extremely thin coating to a base which completely seals the base against the outside.

EXAMPLE 1. A porous silver coat of a thickness of the order of 0.0005 to 0.00075 inch is electrodeposited upon steel. The coated object is immersed into an electrolytic bath consisting of a water solution of 50 cc of concentrated hydrochloric acid in 450 cc of water (or a 10 per cent sodium chloride solution in water). The coated object is polarized as the anode, and a current of 0.1 amp/sq dm is permitted to flow through the system for 10 minutes at room temperature. The coated object is then removed and a very thin film of silver chloride will be found to have formed on the silver coat. The coated object is washed, dried and heated to a temperature of 455° C (the melting point of silver chloride) or somewhat above but below the melting point of silver (960.5° C). The silver chloride becomes limpid and flows into the pores of the silver coat. The object is then removed from the source of heat and permitted to cool. Upon cooling, a nonporous, very thin film of silver and silver chloride of a metallic or white color, depending on the thickness of the fused silver chloride, has been found upon the base. Any excess silver chloride is removed by burnishing or buffing, which gives a pleasing, silver-like appearance.

CLAIM 3. A process of forming a thin nonporous coat on a metallic base, comprising electrodepositing a thin porous silver coat on said base, immersing said



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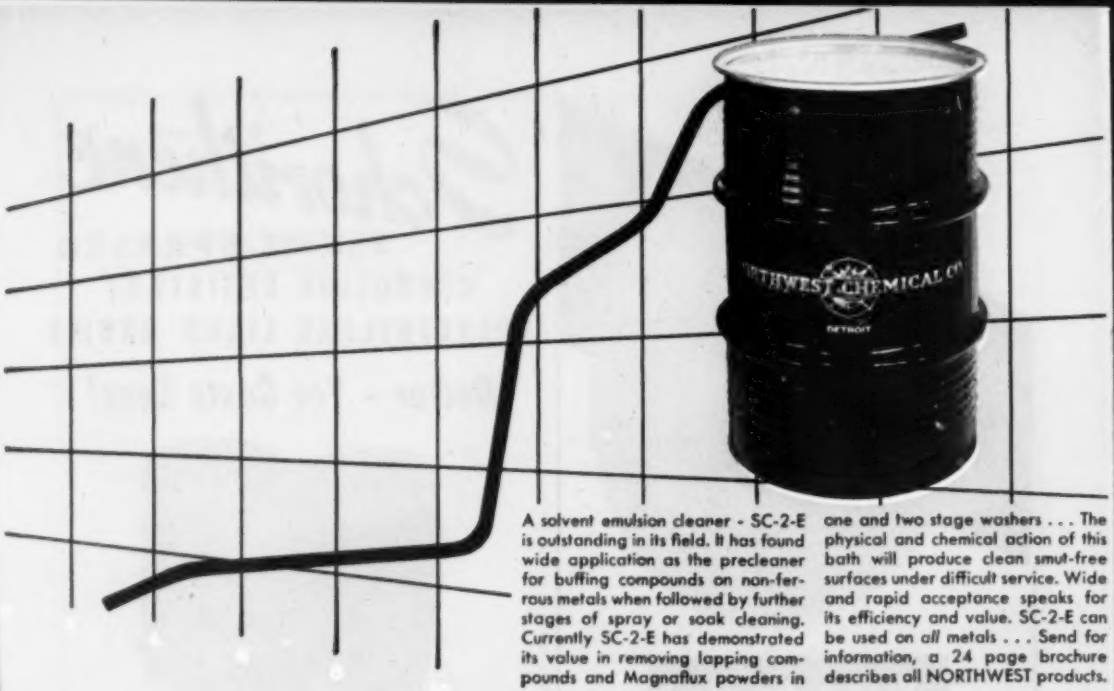

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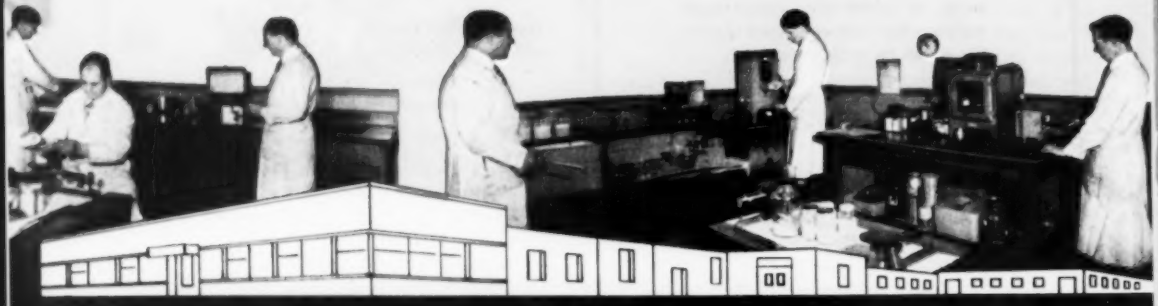

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coated base as an anode in an electrolytic solution capable of electrochemically forming with said silver a water-insoluble fusible silver halide, passing an electric current through said anode and through said electrolytic solution until said porous silver coat has been partly converted into a water-insoluble halide, and heating the surface of said coated base to at least the melting point of the silver halide but below the melting point of silver and of said base, whereby said silver halide is melted and flows into the pores of said thin porous silver coat and conjointly therewith forms a thin nonporous coat on said base.

8 claims, 3 examples.

References cited: U. S. Patents 26,978; 517,275; 1,758,293; 1,872,614; 2,060,530; 2,097,300; 2,307,801. British Patent 3,681.

No. 2,585,700, February 12, 1952—Method of Making Conductive Designs—S. W. Strickman, assignor one-fourth to Charles E. Bloom and one-fourth to Harry C. Bierman.

CLAIM 2. A method of forming conductive designs which comprises providing a photographic film of a substance capable of being gelled by volatile organic liquids with an exposed and developed image in gelatine, removing the gelatine from said exposed image to expose said film at a lower level than the gelatine, spraying a mixture of finely divided conducting particles and a readily volatile organic liquid capable of gelling the surface of said film onto the gelatine side to cause gelling of said film and penetration of said particles into the surface thereof, and evaporating said liquid, whereby said particles adhere to said film, then removing said gelatine.

NOTE. Formulas and methods for application of all solutions used are given in legend.

References cited: U. S. Patent 474,888; 1,622,775; 1,888,344; 2,001,725; 2,066,511; 2,244,187; 2,417,541; 2,506,604.

No. 2,587,630, March 4, 1952—Method for Electrodeposition of Iron in the Form of Continuous Strips—E. H. Konrad and W. E. C. Eustis, assignors to Sulphide Ore Process Company, Inc., New York, N. Y.

CLAIM 2. Method of converting sulfide ores of iron into a continuous strip of metallic iron, which comprises the steps of providing an electrolytic cell comprising a cylindrical cathode having a substantially continuous electrically conductive cathode surface formed of particles of colloidal graphite, an insoluble anode enclosed in a porous diaphragm and an electrolyte therein comprising a catholyte containing ferrous chloride, substantially free from ferric chloride, and an anolyte containing ferric chloride, the anode being in opposed relation to the submerged portion of the cathode and the anode, thereby to effect a preliminary deposit of electrolytic iron upon the cathode surface,

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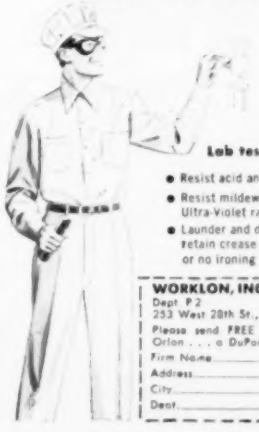

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then rotating the cathode surface continuously into, through and out of the catholyte, thereby to effect electrodeposition of ductile metallic iron upon the cathode surface in the form of a continuous integral strip, simultaneously withdrawing the anolyte from within the diaphragm adjacent the anode, contacting the anolyte with the sulfide ore of iron, thereby to reduce the anolyte to the ferrous condition and replenish the ferrous iron content and cycling the resulting solution into the catholyte, continuously separating the metallic iron from the cathode as a continuous strip and continuously applying a coating of colloidal graphite to the cylindrical cathode surface as the same is exposed out of the bath.

3 claims. 1 figures.

References cited: U. S. Patents 1,412,174; 1,416,692; 1,456,615; 1,952,762; 1,960,563; 1,980,381; 2,429,902. British Patent 8,668. PLATING 35, 45, 46 (January, 1948).

No. 2,587,651. March 4, 1952. Method and Means for the Electrodeposition of Chromium. Floriel A. Rojas.

The invention will be described in greater detail with aid of following examples.

Reaction product A is prepared by mixing

287.5 g crystalline zinc sulfate ($ZnSO_4 \cdot 7H_2O$)
81.4 g zinc oxide (ZnO)
100.0 g chromic anhydride (CrO_3)
250.0 g water

Reaction product B is prepared from the following:

197.4 g barium carbonate ($BaCO_3$)
81.4 g zinc oxide (ZnO)
600.0 g chromic anhydride (CrO_3)
360.0 g water

The ingredients of reaction product A are added to the water, and the water heated to preferably the boiling point in a suitable container until complete solution is obtained. The container should be a non-corrodible material and equipped with an agitator.

(Reaction products B are treated in the same manner.)

In both mixtures A and B, the reactions are not complete until the solutions have become clear, true solutions and contain no undissolved or suspended material.

The above plating bath will operate at all temperatures from room temperature to close to the boiling point of the solution and at a given temperature will function with great current efficiency and at a high current density, with wide ranges of current density being permissible. For example, at 70° F. this bath will plate continuously and successfully at a cathode current density of from 12 to 70 amperes per square foot. For normal plating I prefer to operate at 110° F. with a current density of 700 to 1000 amperes per square foot. In the ranges given, nonporous, non-cracking and nonpeeling chromium will be obtained.

CLAIM 5. An aqueous bath for electrodeposition of chromium having a density of approximately 20° Baumé and comprising chromic acid and means for

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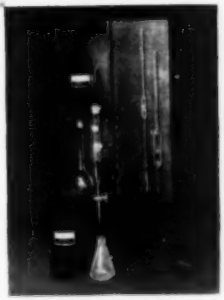

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Patent Abstracts

ionizing the bath and obtained by chemical reaction of the product (A), obtained by mixing together the sulfate and the oxide of one of the metals selected from the group consisting of zinc, nickel and aluminum, with chromic anhydride and water, with product (B), obtained by mixing together the carbonate of one of the alkaline earth metals selected from the group consisting of barium, strontium and calcium, the selected oxide, chromic anhydride and water, the sulfate and carbonate being employed in substantially combining proportions, so that the concentrations of sulfate ion in the bath corresponds substantially only to the solubility of the alkaline earth metal sulfate, the quantity of chromic anhydride being at least sufficient to react completely with all of the oxide and carbonate, the bath containing from 2 to 10 parts of the metallic zinc, nickel or aluminum radical for each 100 parts of chromic acid.

20 claims, 9 examples.

References cited: U. S. Patents 2,050,478; 2,111,002; 2,172,344. Grant, "Hackh's Chemical Dictionary" (1944), p. 175.

No. 2,588,566, March 11, 1952. Electrolytic Process for Stripping Copper. R. L. Peasler, assignor to Curtiss-Wright Corporation.

CLAIM 1. The process of removing copper from the surfaces of a pair of metallic bodies; said process comprising the steps of immersing said bodies in a solution consisting of ammonium carbonate in water having 0.5 to 15 ounces of copper dissolved therein per gallon of solution; and passing an alternating current through said solution with said bodies comprising opposite electrodes for said current, said alternating current comprising symmetrical alternating current having a frequency of 60 cycles per second.

2 claims, 2 figures.

References cited: U. S. Patents 612,250; 1,607,582. French Patent 9,292. British Patent 3,722. Trans. Electrochem. Soc. 77, 207-209 (1940). Metal Cleaning Finishing 5, 465, 466 (November, 1933).

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No. 2,588,734, March 11, 1952—Pretreatment of Beryllium Prior to Coating—Morris Kolodney, assignor to United States of America as represented by United States Atomic Energy Commission.

Pure beryllium has a gray-white lustre when it is freshly machined, but it readily tarnishes. This is also true of metal compositions containing a major proportion by weight of beryllium. It is necessary to maintain an inert atmosphere to cover the beryllium compositions in order to protect them from oxidation. It is also sometimes necessary to coat beryllium with a smooth, pore-tight coating of various metals for use in scientific experiments.

CLAIM 1. The method of treating compositions of beryllium prior to coating which comprises making the composition cathodic in a potassium hydroxide solution having a normality of about 1 and subjecting the composition while therein to a current density of about 0.5 amperes per square inch for about three minutes, removing the composition, making it anodic in a solution consisting essentially of from about 25 to 70 per cent by volume of concentrated phosphoric acid, from 0.1 to 1 per cent hydrochloric acid by volume and the remainder water and subjecting it while in the solution to a current density of from about 0.1 to about 0.5 ampere per square inch for a period of from above five to about ten minutes, removing the article, washing it in water, and dipping it in an aqueous solution consisting essentially of from about 50 to 200 grams per liter of ammonium sulfate and from 25 to 75 cubic centimeters per liter of concentrated sulfuric acid.

2 claims, 2 examples.

References cited: U. S. Patents 1,971,761; 2,057,271; 2,095,519; 2,115,005. Chem. Abs. **39**, 5183 (1945). E. E. Halls, Metal Treatment **12**, No. 42, 71-85 (1945) (abstract article).

No. 2,588,910, March 11, 1952—Anode Shifting Device—J. V. Davis, assignor to The Udylite Corporation.

CLAIM 1. In a continuous plating apparatus, a tank, a rail having a plurality of supports for work pieces carried thereby in a spaced relationship, an anode rail lying parallel to the first rail also carrying a plurality of anodes spaced in opposing relationship to said work pieces, means for intermittently moving said supports along said first-mentioned rail and oscillating-frame means connected to synchronism with said mentioned means for intermittently moving said anode rail transversely of said first rail during the dwell in the movement of the work pieces thereon, the oscillation of the anode rail being in an amplitude sufficient to bring said anodes in close proximity to said work pieces.

2 claims, 5 figures.

References cited: U. S. Patents 587,782; 1,251,569; 1,340,826; 1,427,877; 2,070,343; 2,472,796. British Patent 433,508.

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A. E. S. News

Gustaf Soderberg Makes a Change

Gustaf Soderberg, Editor of the Monthly Review and later PLATING since June 1945, on May 9th resolutely ignored the attraction of printing ink, dead-lines

Soderberg

and all that is associated with the publication of a technical magazine to prepare to board the Nieuw Amsterdam on May 16th and return to his native Sweden. There Gus will teach Applied Electrochemistry and engage in consulting activities.

Mr. Soderberg was Technical Director of The Udylite Corporation 1929-1945, with the Conservation Division of the WPB, 1944-1945 and was with Graham, Crowley and Associates, 1945-1951. Originally functioning on a part-time basis as Editor of PLATING, it soon became apparent that this was a full-time job. The steady improvement in the magazine is the result to a great extent of Editor Soderberg's high standards and unremitting efforts, not only as applied to PLATING but to the A. E. S. as well.

Two Temporary Charter Requests

The organizational meeting of a group in Kansas City was reported a few months ago and a petition for a temporary charter is now at Headquarters carrying twenty-seven signatures.

In almost the same mail a similar request was received from Mr. Burgess and ten other signers requesting a temporary charter for a Wichita Branch of the Society.

This continuing interest in the formation of new A. E. S. Branches is heartening and spotlights the value of the Society to platers and metal finishers.

Sustaining Members

The following companies have joined the ranks of sustaining members, whose dues go to the support of A. E. S. Research:

Acme Galvanizing, Inc., Milwaukee, Wis.

Donald Sales and Mfg. Company.

The Seymour Manufacturing Company, Seymour, Conn.

Sylvester Gartland
Ernest Olds

✣ Rochester Branch regretfully reports that two of its grand Old Timers passed on. Sylvester P. Gartland, one time Supreme President, died on January 17. "Ves", as he was affectionately known by all his associates, retired from General Motors a few years ago, after supervising finishing for a long time. However, his retirement did not change his interest in the Society; he was a regular attendant of the meetings, and by his inspiration was responsible for the success we attained on many occasions.

✣ **Ernest Olds** also passed on the same week. Ernie, who was the metallurgist at the Sharon Optical Company, had attended the Branch meetings regularly and is going to be missed by the youngsters as well as the old guard. We know that the Electroplaters' sympathy goes to both Mrs. Gartland and Mrs. Olds.

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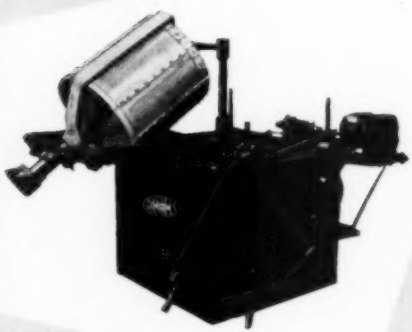

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Branch News

COMING EVENTS

DETROIT BRANCH

Arrangements for the annual Stag Day Party are rapidly nearing completion. The scene of this year's event, as in the past several years, will be the Forest Lake Country Club. Games, contests, hundreds of handsome prizes, entertainment, and a delicious tenderloin steak dinner are a few of the features which will contribute to the festivities.

The committee, which is headed by CHARLIE CONLEY, has chosen Saturday, July 19, for the big day. BOB DUDLEY will be in charge of the athletic program; CARL DURRIN will see that everyone receives a prize; FRED WAGNER is lining up the entertainment; and WALTER PENNER, who engineered the 1950 Stag Day Party, is acting in an advisory capacity.

The price of the tickets covering all events except golf will be $6.00 per copy, the same as last year. They are now available and may be purchased from LES BOUCHERT, whose mailing address is 9120 Roseland Avenue, Detroit 4, Mich.

According to Chairman Conley, attendance at this year's jamboree is expected to break all records.

ALLENTOWN-READING BRANCH

Fourteen members and guests enjoyed the "movie night" arranged by LIBRARIAN LEE WOTRING on January 16. Two films dealing with steel construction work, entitled "Shipways" and "Building the Golden Gate Bridge", were shown through the courtesy of the Bethlehem Steel Company.

During the business session, two men were elected to active membership. JAMES RIEGEL reported on the newly drafted By-Laws which are to be voted upon at the next meeting. PRESIDENT CARL SWARTZ appointed two new committees: the Social Functions Committee with HOWARD SCHEARER as chairman and the Nominating Committee headed by LOUIS STESSMAYER.

PEARL T. TREESBACH,
Secretary-Treasurer

ALLENTOWN-READING BRANCH

At the dinner meeting at Spurgeon's Hotel on February 20, the topic, "A Problem in Plant Location", was discussed by Mr. ROBERT WOLFE, Chief of Public Relations, and Mr. A. P. GIBSON, Factory Planning Engineer, the Allentown plant of the Western Electric Company. The 22 members and guests learned why the company chose Allentown 31/2 years ago, and heard a resume of the problems encountered in (1) the designing of a plating room to operate in the middle of an air-conditioned plant, (2) the treatment of wastes because of tough State laws, (3) the conservation of water made necessary through the lowering of the water table in the community, (4) the degassing of plated parts for use in vacuum tubes, and with (5) labor.

The By-Laws were accepted as written and sent to the National Office for approval. CHAIRMAN LOUIS STESSMAYER presented the report of the Nominating Committee. NORMAN MILLER reported on the Special Meeting of the Supreme Society. An invitation to visit Willson Products, Inc., was extended by ROBERT SOUTHWORTH, and after a discussion the matter was turned over to the Librarian and the Social Function Committee for action.

PEARL T. TREESBACH,
Secretary-Treasurer

BALTIMORE-WASHINGTON BRANCH

On Wednesday, April 9, 1952, the Branch met at the Glenn L. Martin Plant, Baltimore, Md. The plant management invited our group to its cafeteria for dinner. An excellent tour of the aircraft plant followed.

No branch business was brought up.

ASAF A. BENDERLY,
Secretary

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CHICAGO BRANCH

Chicago Branch members turned out in record numbers, 150 including 60 ladies, on April 4 for one of the busiest and best meetings ever held, a Ladies' Night.

After cocktails and dinner, all retired to the auditorium for a special showing of John Nyaz Ott's beautiful and educational movie of growing flowers. Roses, irises, camellias, gladioli, tulips and a host of nature's floral wonders grew from bulbs and seedlings to radiant full bloom on colored film through the magic of Mr. Ott's exclusive time-lapse photography.

Chicago's officers for the 1952 Convention year were then introduced, and installed with appropriate ceremonies noting the Branch's 40th year under the direction of H. J. Gilbertson, A. E. S. Honorary Member and Past President. Ray Leffman was re-elected President with Elmer Olson and Ed Stanek First and Second Vice-Presidents. The perennial Paul Glab will again discharge the duties of secretary, while Joe Andrus attends the librarian's office, as he has so ably done in the past years. The board of managers with Dr. Monaweck as chairman includes Rudy Hazucha and Harold Faint.

Ladies' door prizes were then awarded, with Mrs. Catherine Swenson, Mrs. H. Stopek, Mrs. E. McCoy and Mrs. Harold Younger carrying off merchandise certificates as a token of their attendance.

In concluding the current membership drive, Chairman Ewell McCoy awarded first prize, an electric waffle maker, to Lenny Pravel, with Mr. Clendenin winning two neckties for his excellent efforts. A total of 28 new members joined the Branch as a result of this drive. The retiring officers then submitted their annual reports, and it was noted that the Branch now has 379 active members.

Afterwards everyone adjourned to the dining room for midnight refreshments and fellowship.

Publicity Committee

CINCINNATI BRANCH

Some 40 members and guests were present at the monthly meeting on March 26.

Our By-Laws provided for only one Vice-President, but since our Vice-Presidents during the last two years had to resign on account of their leaving the city, it was decided to amend the By-Laws and elect both a First and a Second Vice-President.

Despite the presence of ward-heelers and various political shenanigans, the following were elected to serve during the ensuing year:

President—Robert D. Miller
First Vice-President—C. H. Truman
Second Vice-President—Wm. Gordon
Librarian—C. Barth
Secretary—Charles Wise
Treasurer—Charles T. Nuzum
Board of Managers—Wm. Albohn

With the exception of Messrs. Gordon, Barth and Albohn, all were re-elected for second or third terms.

President Robert D. Miller appointed S. Chipman, F. Bonem, and C. T. Nuzum Delegates and W. Gordon, J. Beck, and R. Miller Alternates.

The annual picnic with golf, baseball, and horseshoes will be held on June 7 in Devou Park, Ky. (just across the river from Cincinnati). A dinner will be served at approximately $3.00 per person to be paid for by the members, but liquid refreshments will be contributed from the Branch treasury.

Four men were elected to membership, one of them to student membership.

President Miller presented Mr. Walter Prine, of The International Nickel Company, who took "Aspects of Industrial Nickel Plating" as his subject. He stated that in normal times approximately 28,000,000 lb of nickel is used monthly in the United States, of which about 20 per cent goes into nickel plating. Some applications of nickel other than decorative plating were discussed, including catalysts, electroforming and electroplating, electronic instruments, plating on nonconductors, plating for wear resistance, plating for corrosion resistance, and plating of tubes and pipes. A discussion followed.

The Harshaw Chemical Company was the host at the usual social hour.

Robert D. Miller, *President*

GRAND RAPIDS BRANCH

Over 50 members and their wives attended a dinner meeting at Finger's Restaurant on April 16. Everyone enjoyed its famous chicken dinner.

Harold Gruetter, retiring President, cited the past year as a hectic one for platers because of scarcities. He reported a 20 per cent increase in treasury funds,

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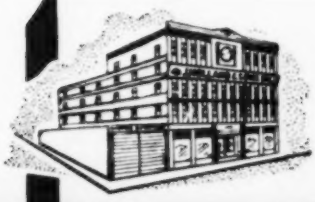

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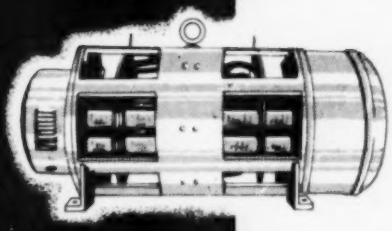

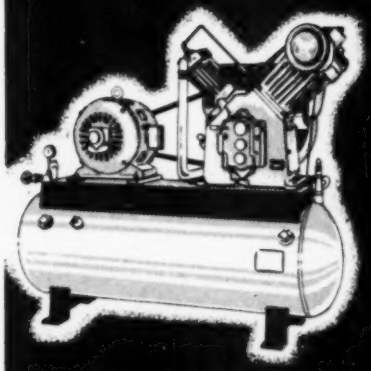

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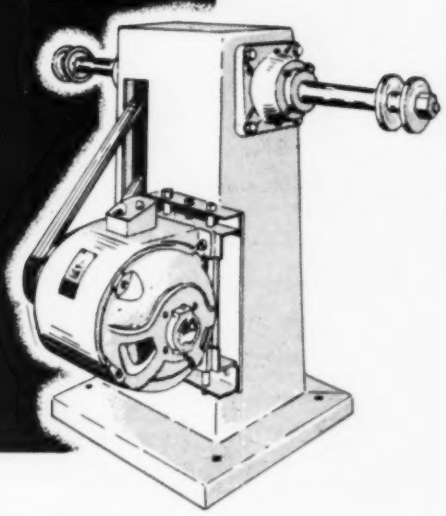

Branch News

and expressed his gratitude for the work of officers and committeemen.

One new member was accepted. Delegates appointed were JACK HANNEY and KENNETH HAMPEL, with CARL GREEN, RUSSELL BOTHE, and STEVE COWDERY as alternates.

PAST PRESIDENT DON SHANTZ then introduced the newly elected officers:

President – JACK J. HANNEY
First Vice-President – JAKE HAGE
Second Vice-President – CARL GREEN
Secretary – KENNETH HAMPEL
Treasurer – ROBERT O. BLACKFORD
Librarian – L. B. SPERRY
Assistant Librarian – ORVILLE HOXIE
Board of Managers – HAROLD GRUTTER, JACK KERSHAW, FRED DARLING

PRESIDENT JACK HANNEY expressed confidence that the Branch would continue to grow, and asked for a hearty round of applause for the fine work of all past officers.

LIBRARIAN LYMAN SPERRY then introduced HERB and MYRNA LLOYD, who, by popular demand, were brought back for the sixth time to show another of their colored-slide travelogs. This trip was a cruise to South America via Alcoa's luxury freighter, "The Cavalier". The 19-day, 5000-mile trip started from New Orleans; proceeded to Kingston, Jamaica; thence to Willemstad on the Island of Curacao of the Dutch West Indies; then to the ports of La Guaira, Puerto Cabello and Guanta of Venezuela, and lastly, to Port of Spain, Capital of Trinidad, and back home to Mobile, Ala. The Lloyds are very adept at showing interesting points on their trips in masterful color photography and received a rising vote of thanks.

CARL GREEN, *Publicity Chairman*

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INDIANAPOLIS BRANCH

The meeting in April was held at the usual place, Fox Steak House, with 28 present.

The president announced that the Board of Managers did not approve of changing the election of officers from May to December. Committee reports were given on the Annual Educational Session and Dinner Dance. DON PATRICK reported that the solicitation of sustaining contributors was most successful. One man was elected to membership.

The librarian acted as moderator of a "Plating Problem Clinic". Many questions were asked and answered, showing the interest in this subject.

EDW. BRUCK, *Secretary*

LANCASTER BRANCH

The monthly meeting on March 14, at the Old Mill Inn, Lincoln Highway West, Lancaster, Pa., had an attendance of 35 members and guests.

Two new members were elected, and four new applications received. CHARLES SNYDER reported on the meeting of the Supreme Society in Philadelphia. CHARLES SNYDER, WILLIAM KLUNK and THEODORE SCHWALM were appointed Delegates, with HARRY HOVIS, EDWARD BEMILLER and WILLIAM FORDNEY serving as their alternates.

LIBRARIAN MARIAN MYERS introduced the speaker, MR. T. C. OBERNDORF, of the General Electric Company, who spoke about "Rectifiers". He discussed the theories and the types of rectifiers, the construction, functioning and advantages of each type, and the kind of assemblies available for particular jobs. He then answered numerous questions. After the meeting had adjourned, those present enjoyed a Dutch lunch.

HARRY A. SAYLOR,
Secretary-Treasurer

LOS ANGELES BRANCH

The 22nd Annual Educational Session and Dinner-Dance was held on Saturday, March 22, at Rodger Young Auditorium. The panel of speakers attracted over 150 members and guests, and there was an exceptionally fine exhibit of metal-finishing equipment, as well as of finished parts processed by local manufacturers and allied industries.

The Dinner-Dance was well attended by nearly 450 people, including several out-of-town guests. The ladies' favors were beautiful compacts, and the 100-odd door prizes were exceptionally nice. They ranged from merchandise certificates to chromium plated furniture, and included a large number of electric appliances, lamps, kitchen ware, phonograph records and other items too numerous to mention.

DR. HENRY BROWN, of The Udylite Corporation, Detroit, Mich., presented a very fine discussion of the "whys" of corrosion of ferrous and nonferrous items

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plated with copper, nickel, or chromium or combinations thereof, telling what happens both to the coatings and the cathodic basis metal. He presented very interesting slides and showed plated test panels which had been exposed to various types of corrosion (humidity, salt spray, and outdoor atmosphere) as well as electrodeposited foils to illustrate his points.

MR. T. C. ADAMSON, JR., of the California Institute of Technology, Pasadena, Calif., discussed an interesting subject, "Jet Propulsion", which apparently originated in China in about 1200 A.D. He made comparisons between jet, rocket, and reciprocating engines as to speeds, altitudes, costs, uses, and limitations. Color motion pictures of captured German film showed tests with the V-2 Rocket at Pennemunde.

DR. DONALD PRICE, Oakite Products, Inc., New York City, first described the operations of the A.E.S. Research Committee, past, present, and future, and spoke briefly on the newest Research Project, one of finding an accelerated corrosion test that it is hoped will be more accurate and less controversial than the present salt-fog method. He then discussed surface-active agents, including a short history beginning with the first German patent in 1917. Between 500 and 1000 different synthetic detergents are being used today in industry. Of the 1,200,000,000 pounds sold in 1950, 60 per cent went to the retail trade for home use, and the balance was used in industry for textiles and insecticides and, in the metal finishing industry, for cleaning, pickling and plating solutions. Examples of the three types—anionic, cationic, and nonionic—were shown on slides. A laboratory demonstration illustrated some of his points.

DR. M. M. BECKWITH, of Harshaw Chemical Company, Cleveland, Ohio, gave an interesting discussion on "Fluoborates in Plating Solutions". A good many of the heavy-metal salts are soluble in water, but curiously enough the alkali metal salts are insoluble or relatively so. Fine-grained deposits can in some cases be produced from fluoborate baths at higher deposition rates then from conventional type solutions. An extremely simple analytical method for checking thickness and composition of lead-tin alloy deposits by means of a substitute cathode and simple arithmetical means was presented. The tin content of this alloy can be changed by varying the addition agents and current densities.

The discussions following these excellent papers showed clearly the interest which they evoked.

A color motion picture with sound, "Strength in the West", courtesy Kaiser Steel Company, completed the program.

G. STUART KRENTEL, *Secretary*

MILWAUKEE BRANCH

Fifty-seven members and guests were present at the 428th regular meeting on April 4, when PRESIDENT E. ROBINSON introduced three new members.

TED HARTSHORN announced that sustaining memberships were now held by the Allen-Bradley Co., Kohler Co., S. K. Williams Co., Acme Galvanizing, Inc., and Donald Sales and Mfg. Co. GLEN SCHWEMER reported on the excellent Wisconsin job platers.

The guest speaker, DR. CHARLES L. FAUST, of the Battelle Memorial Institute, presented an interesting discussion of "Some Metallurgical Aspects of Metal Finishing", describing how a surface is affected by grinding, sanding, polishing and electropolishing. Slides illustrating the effects of these treatments indicated the influence that surface finish has on the adhesion and structure of the deposited metal. The speaker then answered many specific questions on surface finishing.

E. E. PIELLISCH, *Secretary-Treasurer*

MONTREAL BRANCH

At the regular March meeting, 28 members and guests heard MR. J. D. FAIRBAIRN, Chief Chemist of R.C.A. Victor, Montreal, speak on "Complex Ions and Cyanide Solutions".

The speaker explained the ionization of acid, base and salt solutions and the formation of complex ions, especially the cyanide complex ions. He also showed how to calculate (1) the weight percentage of each part of a complex compound and (2) the amount of cyanide required per pound of copper, zinc and cadmium. The subject was presented in a direct, simple and most interesting way, of great interest to the members.

The annual financial and membership reports were given. The 1952–1953 executives were seated, and a past-president

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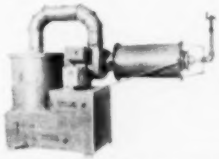
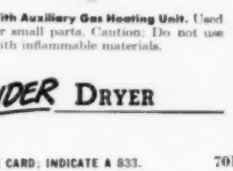


2. **With Auxiliary Steam Heating Unit.** Used for small parts that hold moisture—lacquered parts—or where cold water rinse is used.



3. **With Auxiliary Gas Heating Unit.** Used for small parts. Caution: Do not use with inflammable materials.

NEW HOLLAND KREIDER DRYER

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pin was offered to the retiring president, W. Glover.

L. A. Robillard, *Secretary*

MONTREAL BRANCH

At the regular monthly meeting on April 1, 27 members and guests heard Mr. Wilfred S. McKeon, President of Sulphur Products Company, speak on "Stripping Copper Non-Dangerously". The sulfide-cyanide solution is one of the few that will not attack the base metal. It does not require current for operation, and ordinary ventilation is adequate. The subject was exceptionally well covered, and the presentation very well received by the audience.

H. F. Brown, a guest from the Chicago Branch, issued a cordial welcome to the Chicago Convention.

The following members have been appointed to the Banquet Committee: J. J. Roche, Chairman; B. Kelly, J. G. Carbeau, and the secretary. The date for the Annual Banquet is Thursday, October 2.

J. T. Reisenburg, Jr., *Secretary*

NEW HAVEN BRANCH

Mr. Hubert Goldman, of Enthone, Inc., New Haven, Conn., delivered an excellent explanation of methods of "Barrel Finishing" at the March meeting, copiously illustrated with excellent color slides. All in all it was a very enjoyable and instructive evening.

Goldman

Larry Durney, *Librarian*

NEWARK BRANCH

There were 50 members and guests in attendance at the regular meeting on February 15.

Following a short movie film on "How Not To Conduct a Meeting", a short business meeting was held at which two new members, one in-transfer and two new applications were received. President Frank England appointed Samuel Frey, George Reuter, and Dr. Henry Linford members of the nominating committee for next year's officers.

Librarian Robert Horrocks introduced Mr. George B. Hogaboom, Finishing Consultant, who spoke about "Effects of Base Metal on the Subsequent Electrodeposit". By means of lantern slides, he demonstrated that the crystal structure of the basis metal has a tendency to continue in the first molecular layers of the metal electrodeposited over it. One of the factors that might interfere is a treatment that leaves a highly worked surface sandwiched in between the plate and the basis metals. His talk was well received, and stimulated the audience to ask a number of questions during the discussion period.

First Vice-President Robert Eberhardt gave a brief review on an English book, "Analysis of Plating Solutions", by Langford, which he found well organized and one of the best on plating solutions.

Samuel S. Frey, *Recording Secretary*

NEWARK BRANCH

Before the regular meeting on March 21, Howard Cobb showed a movie of his trip through the West.

At the request of President Frank England, all the members stood in silent tribute to Past President Horace Smith, who departed from this life on February 21. He was associated with Newark Branch for 38 years. May he rest in peace!

There were three new applications for membership; two new members were elected, and one was received by transfer.

The nominating committee, Dr. Henry B. Linford, chairman, read a list of officers and delegates for the coming year:

President—Robert Eberhardt
First Vice-President—Robert Horrocks
Second Vice-President—John Gumm
Secretary-Treasurer—George Wagner
Recording Secretary—George Reuter
Librarian—Thomas Austin
Sergeant-at-Arms—Clifford Struyk
Board of Managers—Frank England, Myron Diggin, Samuel Frey
Delegates—George Wagner, John Gumm, A. P. Munning
Alternates—Robert Eberhardt, Samuel Frey, Henry B. Linford

All were duly elected, and the officers installed by Samuel Taylor.

Robert Horrocks introduced Mr. B. Vandenberg, Aluminum Company of America, who first showed a very interesting film on the "Manufacture of Aluminum and Its Products" and then slides of different methods of plating and anodizing aluminum. His presentation was well received.

George Reuter, *Recording Secretary*

PHILADELPHIA BRANCH

The regular meeting at the Harrison Laboratory of the University of Pennsylvania on March 28 had an attendance of 40 members and guests.

The first speaker of the evening was Mr. John E. Tarman, Director of the Consulting Division, W. H. and L. D. Betz Company, who spoke about "Plating Room Waste Treatment and Disposal". The waste disposal problem in a manufacturing plant is generally different from that of a job plating shop, because of the constantly changing type of parts being processed and the variety of solutions handled in the latter. He referred to the bulletin distributed by the Ohio River Valley Sanitation Commission on minimization of plating-room wastes by control of dragout and by proper rack design and maintenance. The engineering aspects of plating-room layout with respect to waste handling and the factors in setting up a waste-disposal plant were discussed, also the chemistry and methods of treating cyanides, acids, hexavalent chromium and oil-bearing wastes. The practice of good housekeeping and minimizing of wastes will go a long way in solving a waste-disposal problem.

The second speaker was Mr. Robert Pierce, Manager of the Corrosion Engineering Products Division, Pennsylvania Salt Manufacturing Company, who gave a brief talk on "Construction of Waste Disposal Equipment". The three factors to be considered are the spillage areas, the collection of the wastes, and the neutralization of the wastes to render them suitable for disposal. Of the three basic engineering-construction materials available, metals, wood and concrete, concrete is the most widely used in the treatment of wastes. However, because of its very poor resistance to practically all commonly treated waste materials, excepting those containing phosphoric acid or alkalies, it is necessary to protect concrete with chemical-resisting layers, such as mastic. Acid-resisting brick of various types are laid over the mastic layer to protect it where load is a factor. Slides were shown of various types of construction and how they have stood up in service. In planning an acid-resisting floor with drains, a pitch of $\frac{1}{4}$ inch to the foot should be allowed for proper drainage.

The following were elected unanimously to serve for the 1952–1953 term:

President—Alfred H. Pope
First Vice-President—Edwin F. Ottens
Second Vice-President—William H. Trusdell
Secretary—I. Wm. Marcovitch
Treasurer—George M. Long
Librarian—Clarence E. Boerckel
Board of Managers—Nat Verrelle, Robert L. Farren, Jr., Samuel Heiman, Paul Mentzer, Sr.
Delegates—George M. Long, Samuel Heiman, I. Wm. Marcovitch
Alternates—Frederick Fulforth, Paul Mentzer, Sr., Delmar R. Robson

Applications for two active members were received. The secretary read a report of an analysis of the membership as of March 31, 1952: Employed directly in the plating industry: owners, 25; chemists and technicians, 24; platers, 98. Employed by suppliers: sales, 46; technical, 9. Of the total branch membership of 202, 73 per cent were employed by the

plating industry and 27 per cent by suppliers.

L. Wm. Marcovitch, *Secretary*

ROCHESTER BRANCH

At the March meeting, Mr. Schroeder, Sales Manager of Electric Product Company, Cleveland, Ohio, gave a very informative talk, entitled "Power Equipment—The Core of Plating", in which he gave a most interesting discussion of the relative merits of motor-generator and rectifiers.

The Branch now holds its meetings at the Forty Over Eight Club on 933 University Avenue.

Charles B. Fiedler, *Secretary*

ROCKFORD BRANCH

The monthly meeting on April 14 was held jointly with the Rock River Valley Quality Control Group. A total of 54 attended the dinner and 61 the educational session.

The speaker of the evening was Prof. Robert Hogg of the University of Iowa, Iowa City. His subject, "Some Applications of Sampling Theory", concerned the basic rules, symbols, methods and purposes of quality control. Many applications and processes in industry are overlooked, although it is possible to record and control them within certain limits. Quality control is a basic tool and as essential as any other tool. Prof. Hogg was very successful in putting over his points to those not familiar with the subject.

Questions were asked of the speaker concerning control of buffing and polishing operations for which only visual standards are available. This type of problem is being worked out in some applications with photographs, and the speaker gave some examples from paper mills.

One new member was admitted to the Branch.

Kenneth Kieselburg, *Secretary-Treasurer*

SAGINAW VALLEY BRANCH

One hundred and sixty-four members and guests attended the 3rd Annual Dinner Party held for the ladies on February 16 in Zehnders Hotel, Frankenmuth, Mich.

The party was one great success. Frankenmuth famous chicken was served at the dinner to the accompaniment of organ music by R. Muckeclin. The ladies were presented with tea cups and saucers as favors.

Dancing followed with music by Gene, Mallak's orchestra. A photographer was on hand taking pictures of the events during the evening. Community singing was in progress throughout the late hours of the evening.

Thanks go out to Mel Tippman, Chairman of the Arrangements Committee, for a splendid job.

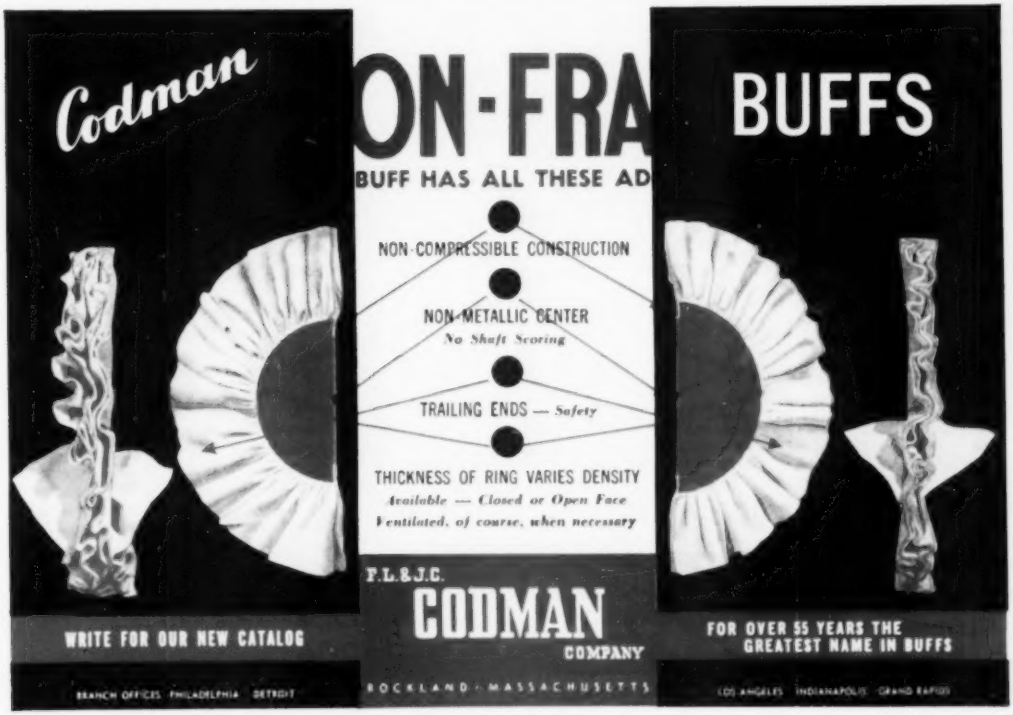
Elbon A. Bresson, *Recording Secretary*

ST. JOSEPH VALLEY BRANCH

The regular monthly meeting on April 2 was the annual Ladies' Night. William McDowell was chairman of the arrangements. One applicant was elected to active membership.

The guest speakers were Dr. and Mrs. H. C. Schlosser, who jointly presented their experiences of a world tour. The highlight was a safari through South West Africa. Dr. Schlosser told of his hunting expedition, and with his outstanding photographs showed all the kinds of wild animals they had hunted during their 9-week trek through the veldt. Mrs. Schlosser spoke about her sojourns in Egypt, Japan and Hawaii, and showed some beautiful pictures of sunrises and sunsets, and of a variety of orchids and other flowers which they had seen during their travels. At the conclusion of their 1½-hour lecture, Dr. and Mrs. Schlosser answered many questions both about the hunting experiences and told human interest stories. Bill McDowell presented Dr. and Mrs. Schlosser with a cake which Mrs. McDowell had baked especially for this occasion. To each lady, the Branch, through Mrs. McDowell, presented a carnation corsage.

Eugene Roth, *Secretary-Treasurer*



ST. LOUIS BRANCH

Vice-President Julius opened the March meeting. The 39 members present were called upon to introduce themselves. Messrs. Berra, Shumway and Ellis reported for the Dance Committee. After a long discussion in conjunction with the dance it was voted to dispense with the Educational Session.

The candidates proposed by the Nominating Committee were elected, as follows:

President—Mr. Julius
First Vice-President—Mr. Bolyard
Second Vice-President—Mr. Shumway
Sergeant-at-Arms—Mr. Koderhandt
Secretary-Treasurer—Mr. Hunleth
Librarian—Mr. Burnett
Board of Managers—Mr. Ellis, Mr. Pinkerton and Mr. Shinall.

The speaker of the evening was Dr. H. L. Kellner of the Lea Manufacturing Co.

Edward Hunleth, *Secretary*

ST. LOUIS BRANCH

At the April meeting, there were 26 on hand for the dinner and 36 for the meeting. Mr. Julius reported for the Membership Committee and introduced two new members. Mr. Koderhandt reported for the Welfare Committee. Mr. Shinall is leaving St. Louis and had asked for a transfer to the Dallas Branch.

Messrs. Coulson, Bolyard and Dinguldin were appointed Delegates, and Messrs. Robins, Davies and Hamm alternates.

It was announced that Kansas City is forming its own Branch. After Mr. Moran had been elected to fill Mr. Shinall's place on the Board, Mr. Davies installed the new officers.

Librarian Weisberg introduced the speaker of the evening, Mr. W. C. Enright, of the Automotive Rubber Co.

Edward Hunleth, *Secretary*

SAN FRANCISCO BRANCH

The regular meeting on February 21 in St. Julien's Restaurant, San Francisco, had an attendance of 12 members and one visitor.

Thanks were expressed to the Christmas Party Committee, Edward Moon, Clarence Owens and Jordan Davis, and to F. W. and Mrs. Huntington for the party decorations. Following a lengthy discussion on succession in Branch offices, a Nominating Committee was appointed consisting of J. R. Pattenger, C. R. Owens and F. Huntington.

A Round Table discussion of yellow- and white-brass plating brought out that available processes for white brass appeared difficult to control but that work on them is being continued. Jeff Davis is preparing a paper covering a theoretical study of brass plating which he hopes to present before the Branch.

Horace J. Smith, *Secretary-Treasurer*

SAN FRANCISCO BRANCH

At the meeting on March 17 attended by 26, the Nominating Committee submitted a slate of officers, who were elected unanimously:

President—J. R. Pattenger
First Vice-President—Stuart W. Pankey
Second Vice-President—Lewis C. Tompkins
Librarian—F. W. Huntington
Secretary-Treasurer—Horace J. Smith
Board of Managers—C. R. Owens, Chairman; Jack Hite, E. M. Alexander

Three applicants were elected to membership.

The meeting was then turned over to Dr. Donald Price, Oakite Products, Inc., for an informative talk on "Wetting Agents and Their Use in Electroplating". Dr. Price also covered aspects of the A. E. S. Research Program. Mr. Kenneth P. Bellinger, Vice-President of the Chemical Corporation, gave an interesting talk about zinc plating, conversion coatings, and some new materials for tank and hood lining that his company is placing in the field. Copies of both talks are available to the membership on request to the Secretary.

Horace J. Smith,
Secretary-Treasurer

TORONTO BRANCH

On March 14, Jimmie Guffie introduced the guest speaker, Dr. J. E. Stareck, of United Chromium, Inc., De-

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troit, Mich. His subject was, "The Mechanism of Corrosion of Composite Electrodeposits". Dr. Stareck showed slides explaining how the corrosion resistance depends on the order in which the coating metals were deposited, e.g., nickel-chromium- and copper-nickel-chromium on steel. Numerous interesting questions were answered.

A Nominating Committee was appointed consisting of R. Clark, A. Findlay and E. Brandy. There were two applicants for membership, and two new members were accepted.

A. L. Coxhead, *Correspondent*

TWIN CITY BRANCH

The Branch met for a dinner meeting on April 7 with Jerome M. Weller, of the Minneapolis Regulator Company, serving as chairman in absence of President Wray Schorr.

Two new members were introduced. Paul Hesse, of the Union Brass & Metal Manufacturing Company, reported on the Annual Branch Party, which will be held on Monday, June 2. He also stressed the importance of our participation in the Branch Exhibits at the Convention.

E. H. Lindemann, of Minneapolis Honeywell Regulator Company, Chairman, reported for the Nominating Committee. The following were elected:

President—Jerome M. Weller
First Vice-President—Paul Hesse
Second Vice-President—George Reed
Secretary-Treasurer—Robert L. Buckley
Librarian—Fred J. Kaim
Board of Managers—Adolph Levine, Ben J. Rosenthal, Wray Schorr, Frank Kilpatrick

The newly elected officers were given a vote of confidence.

Following a short intermission, Librarian George C. Reed introduced Mr. Roy J. Bierman, of Minneapolis Honeywell Regulator Company, a member of the Branch, who spoke about "A New Concept on Controls". Mr. Bierman showed slides in addition to his talk, which was of interest to all.

Robert L. Buckley,
Secretary-Treasurer

WATERBURY BRANCH

A. E. S. President Cleve Nixon honored us with his presence at the meeting on March 14. Coming to acquaint us with the new process of Fidgenizing, recently developed by General Motors Corporation, he presented a talk on "Some Aspects of Basis Metal Finishing" that attracted one of the largest groups we have had at a meeting for some time. It included people from other Branches and towns, even from Massachusetts, which indicated the intense interest in this method, which cuts finishing costs tremendously. Basically, it consists of revolving work in a slurry of abrasive, maize and wood flour to obtain a smooth surface, which, though not bright, takes an excellent finish when plated in a bath with good leveling characteristics. Comparison was made to show relative production and cost of the usual automatic-machine polishing and buffing and this newer method. A series of slides illustrated both types. Of special interest to our group was the low speeds (1150–1450 rpm) at which buffing is done at General Motors, with savings in buffs and compounds and as good a job as at higher speeds.

The Doehler-Jarvis Corporation provided the movie, "The Shortest Way", an excellent film showing the intricacies of mass production of diecastings. The excellent shots of the plating and buffing of diecastings were of particular interest.

Two applicants were elected members. Ed Jackson, for many years with Seth Thomas Clock Company and always active in the Branch, has moved to Little Rock, Ark., where he is working for U. S. Time Corporation. We are happy to say he is retaining his membership in the Waterbury Branch and would like to hear from his friends. Frederick Gilbert, who has been with Chromium Corporation, has moved to Kansas City; he has requested transfer to the new Kansas City Branch.

Spencer L. Henn, *Secretary*

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Farrand Optical Company, Inc.
4401 Bronx Boulevard, Bronx, N. Y.

Second Vice-President.....Dr. G. P. SWIFT
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Third Vice-President.....Dr. R. A. SCHAEFER
Cleveland Graphite Bronze Company
17000 St. Clair Avenue, Cleveland 10, Ohio

Past President.....W. J. NEILL
Columbus Metal Products, Inc.
1341 Norton Avenue, Columbus 12, Ohio

Executive Secretary.....Dr. D. G. FOULKE
P. O. Box 168, Jenkintown, Pa.

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Oakite Products, Inc.
40 Thames Street, New York 6, N. Y.

Secretary.....The Executive Secretary

ADELAIDE, AUSTRALIA meets second Wednesday of each month. Address G.P.O. Box 598E, Adelaide, S. A., Australia.

ALLENTOWN-READING meets third Wednesday of each month in Spurgeon's Hotel, Allentown, Pa. Secretary-Treasurer, Lee C. Wotring, 526 N. St. Elmo Street, Allentown, Pa. Research Finance Committee Chairman, William R. Pfeiffer, Jr., 975 Green Street, Allentown, Pa.

BALTIMORE-WASHINGTON meets second Tuesday of each month with meetings in Baltimore at the Engineers' Club and in Washington, D. C., at the National Bureau of Standards. Secretary, Asaf A. Benderly, 1829 Summit Place, N. W., Washington 9, D. C.

BOSTON meets first Thursday of each month in Hotel Statler. Secretary, Dr. George P. Swift, 53 Galen Street, Watertown 72, Mass. Research Finance Committee Chairman, Eugene P. Carter, c/o United Carr Fastener Corporation, 81 Ames Street, Cambridge, Mass.

BRIDGEPORT meets second Friday of each month in Barnum Hotel. Secretary-Treasurer, Gerald B. Rice, 367 Granfield Avenue, Bridgeport 8, Conn. Research Finance Committee Chairman, Carl Schaefer, c/o Casco Products Corporation, 512 Hancock Avenue, Bridgeport 5, Conn.

BUFFALO meets first Friday of each month in Markeen Hotel. Secretary and Research Finance Committee Chairman, B. P. Fortin, Jr., 209 Forest Drive, Orchard Park, N. Y.

CHICAGO meets second Friday of each month at 8 P. M. at Western Society of Engineers, 84 E. Randolph Street. Secretary-Treasurer, Paul Glab, 882 N. Paulina Street, Chicago, Ill. Research Finance Committee Chairman, William B. Johnson, c/o Industrial Filter & Pump Manufacturing Company, 5914 Ogden Avenue, Chicago 50, Ill.

CINCINNATI meets fourth Wednesday of each month at 8 P. M. in Engineering Society Headquarters, McMillan Street and Woodburn Avenue. Secretary, Charles Wise, c/o The Buckeye Products Company, 7020 Vine Street, Cincinnati 16, Ohio.

CLEVELAND meets first Friday of each month in Hotel Carter at 8 P. M. Secretary-Treasurer, A. J. Lupien, 4408 Carnegie Ave., Cleveland 3, Ohio. Research Finance Committee Chairman, John D. Little, c/o The Harshaw Chemical Company, 1945 E. 97th Street, Cleveland 6, Ohio.

COLUMBUS meets first Friday of each month at 8 P. M. in Battelle Memorial Institute Auditorium. Secretary-Treasurer, John Soderberg, 40 W. Long Street, Columbus, Ohio. Research Finance Committee Chairman, Fred Brune, R. D. 7, Marion, Ohio.

DALLAS-FORT WORTH. Secretary-Treasurer, A. C. Fricke, 1415 Plowman Avenue, Dallas 8, Texas.

DAYTON meets first Friday of each month in Engineers Club. Secretary, Paul E. Geske, 41 S. Bromfield Road, Dayton 9, Ohio. Research Finance Committee Chairman, Robert L. Ruleff, 1002 Broadview Boulevard, Dayton 9, Ohio.

DETROIT meets first Friday of each month in Hotel Statler. Secretary-Treasurer, William H. Mogle, 1623 Wildwood, Jackson, Mich. Research Finance Committee Chairman, W. B. Knight, c/o Knight Plating Company, 1143 Bellevue Avenue, Detroit 11, Mich.

GRAND RAPIDS meets second Friday of each month at 7:30 P. M. in Rowe Hotel. Secretary, Kenneth Hampel, 138 Elwood Street, Grandville, Mich. Research Finance Committee Chairman, Harold Grutter, 1222 Gladstone Avenue, S. E., Grand Rapids, Mich.

HAMILTON BRANCH meets third Thursday of each month in the Conference Room, West End Plant, Canadian Westinghouse Company, Ltd. Secretary, H. Fallowes, c/o Electroplating Division, Steel Company of Canada, Canada Works, Hamilton, Ontario, Canada.

HARTFORD meets third Monday of each month in Hotel Bond. Secretary, Stanley Platox, 26 Erwin Place, New Britain, Conn. Research Finance Committee Chairman, Frank W. Smith, 46 Cottage Street, Meriden, Conn.

HOUSTON meets fourth Friday of each month at 7:30 P. M. Secretary-Treasurer, J. R. Byerley, Dixie Electroplating Company, 3001 Engelke Street, Houston, Texas.

INDIANAPOLIS meets first Wednesday of each month at Fox Steak House, 1207 E. Washington Street. Secretary, Edward Bruck, Platers Supply Company, 2311 Valley Avenue, Indianapolis 18, Ind.

JACKSON-LANSING meets second Tuesday of each month alternating between Hayes Hotel in Jackson and Porter Hotel in Lansing. Secretary-Treasurer, Fred Stockenberg, P. O. Box 501, Lansing 2, Mich.

LANCASTER meets second Friday of each month at 8 P. M. in Thaddeus Stevens Industrial School. Secretary-Treasurer, Harry A. Saylor, 40 N. Poplar Street, Elizabethtown, Pa. Research Finance Committee Chairman, Harry Hovis, Lincoln Highway, West Lancaster, Pa.

LOS ANGELES meets second Wednesday of each month at 6:30 P. M. in Rodger Young Auditorium. Secretary, Earl W. Arnold, 7506 Collett Street, Van Nuys, Calif. Research Finance Committee Chairman, Jack Beall, 1272 Inverness Drive, Pasadena, Calif.

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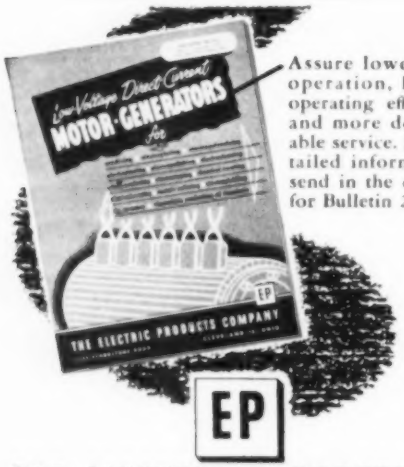

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LOUISVILLE meets third Thursday of each month in Room 119, Speed Scientific Building, University of Louisville. Secretary-Treasurer, J. W. Scholl, Route 2, Georgetown, Ind. Research Finance Committee Chairman, T. K. Allison, 301 W. Main Street, Louisville 2, Ky.

MELBOURNE, AUSTRALIA meets third Thursday of each month at 8 P. M. in Metallurgy Theatre, Melbourne Technical College, 124 Latrobe Street. Honorary Secretary-Treasurer, C. E. Nayler, 55 Durham Road, Surrey Hills, E. 10, Victoria, Australia.

MILWAUKEE meets first Friday of each month in Red Arrow Club, 774 N. Broadway. Secretary-Treasurer, E. E. Pielusch, 2921 S. 90th Street, West Allis 14, Wis. Research Finance Committee Chairman, Phil J. Ritzenthaler, 1928 S. 62nd Street, Milwaukee 14, Wis.

MONTREAL meets first Tuesday of each month in Mount Royal Hotel. Secretary, J. T. Reisenburg, Jr. Research Finance Committee Chairman, P. M. Coudy, c/o Alloycraft, Ltd., 27 Hillside Avenue, Westmount, Montreal 6, P. Q., Canada.

NEWARK meets third Friday of each month at 8 P. M. in Hotel Robert Treat. Secretary-Treasurer, George Wagner, Hy-Grade Electro Plating Company, 35 Fourth Street, Newark, N. J. Research Finance Committee Chairman, Edwin Bowerman, 166-41 17th Avenue, Whitestone, N. Y.

NEW HAVEN meets second Tuesday of each month alternating between Sterling Chemistry Laboratory, Yale University, and Hotel Taft. Secretary-Treasurer, Clark A. Brown, 46 Loller Road, Hamden, Conn. Research Finance Committee Chairman, Dr. H. L. Kellner, c/o Lea Manufacturing Company, 16 Cherry Avenue, Waterbury 86, Conn.

NEW YORK meets second and fourth Fridays of each month in Statler Hotel. Secretary-Treasurer, George Schore, 150 Bennett Avenue, New York 33, N. Y. Research Finance Committee Chairman, George F. Hermann, 52 Chestnut Street, Brooklyn 8, N. Y.

PHILADELPHIA meets fourth Friday of each month in Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Streets. Secretary, I. William Marcovitch, 1434 Lardner Street, Philadelphia 24, Pa. Research Finance Committee Chairman, Robert H. Tiers, c/o Pennsylvania Salt Manufacturing Company, Box 4388, Philadelphia 18, Pa.

PITTSBURGH meets second Thursday of each month in the Avon Room of Sheraton Hotel. Secretary, R. H. Schindler, 125 Fairfax Road, Forest Hills, Pittsburgh 21, Pa. Research Finance Committee Chairman, S. S. Johnston, c/o Weirton Steel Company, Weirton, W. Va.

PROVIDENCE-ATTLEBORO meets third Monday of each month in Providence Engineering Society Hall, 195 Angell Street, Providence, R. I. Secretary, George A. Gibbs, 65 Farragut Avenue, Providence, R. I. Research Finance Committee Chairman, Pierre B. Lounsbury, 78 North Avenue, Attleboro, Mass.

ROCHESTER meets third Monday of each month at the Forty Over Eight Club, 933 University Avenue. Secretary, Charles B. Fidser, 130 St. Casimir Street, Rochester, N. Y. Research Finance Committee Chairman, Cecil Thornton, 20 Lafayette Parkway, Rochester, N. Y.

ROCKFORD meets second Monday of each month in Faust Hotel. Secretary, Kenneth Kieselburg, 419 Theodore Street, Rockford, Ill. Research Finance Committee Chairman, David Stockton, The Udylite Corporation, 1943 Walnut Street, Chicago 12, Ill.

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ST. JOSEPH VALLEY meets first Wednesday of each month at 8 P. M. in Hotel Elkhart, Elkhart, Ind. Secretary-Treasurer, Eugene Roth, 1720 Mishawaka Avenue, South Bend 15, Ind. Research Finance Committee Chairman, William McDowell, 211 Sycamore Street, Elkhart, Ind.

ST. LOUIS meets second Wednesday of each month in York Hotel. Secretary-Treasurer, E. R. Hunleth, 4415 Michigan Avenue, St. Louis, Mo. Research Finance Committee Chairman, Dale Bolyard, 1303 Alfred Street, St. Louis 10, Mo.

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TWIN CITY meets first Monday of each month, October through June, in the Covered Wagon Lodge Room, 114 S. 4th Street, Minneapolis, Minn., with dinner at 7:00 P. M. and business and technical session at 8:00 P. M. Secretary-Treasurer, Robert L. Buckley, c/o Industrial Chemical & Equipment Co., 205 11th Avenue So., Minneapolis 15, Minn. Research Finance Committee Chairman, E. H. Lindemann, c/o Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

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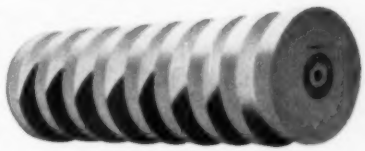

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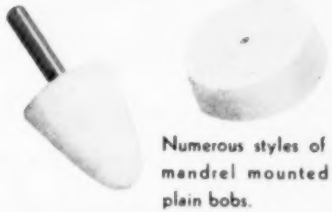

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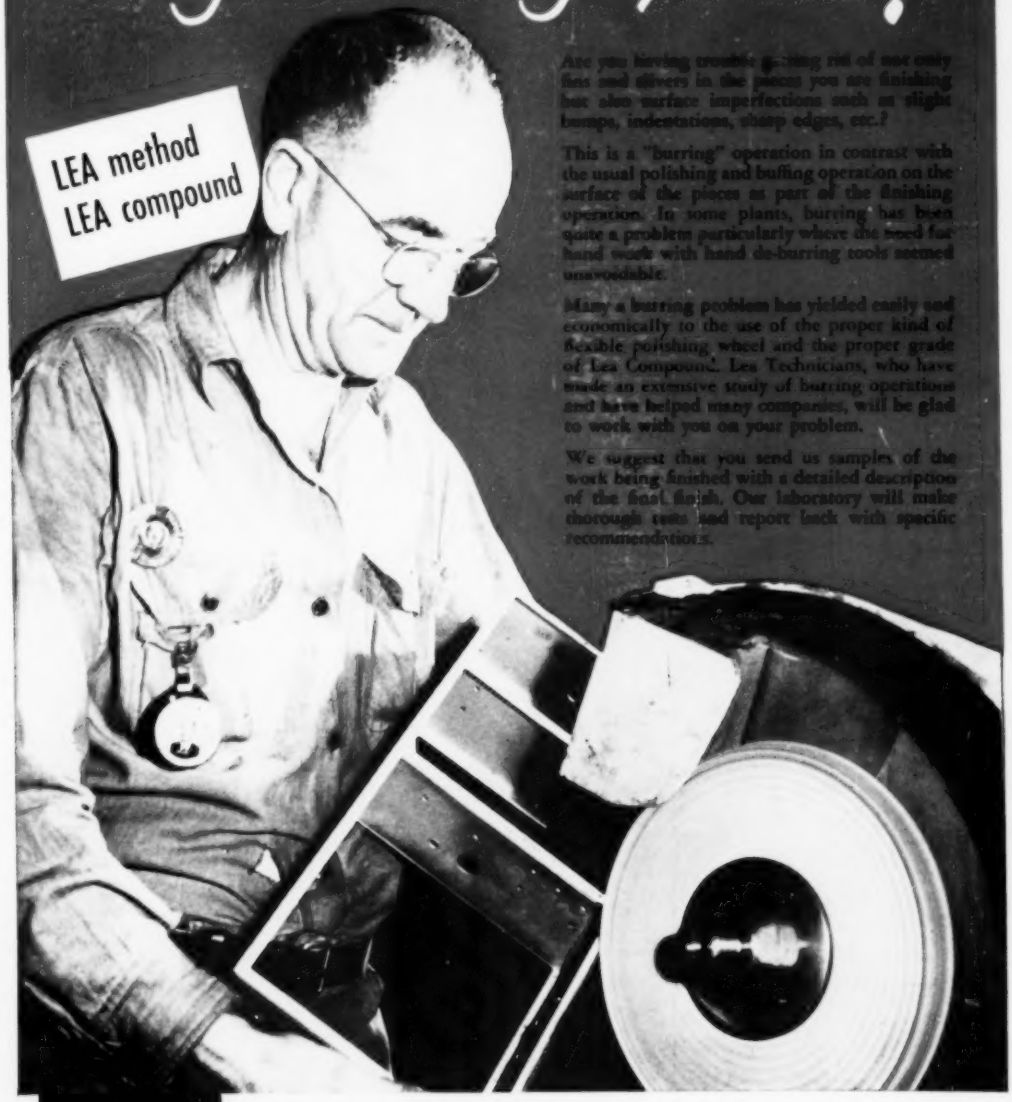
Burring...don't let it get you down!



Are you having trouble getting rid of not only fins and slivers in the pieces you are finishing but also surface imperfections such as slight bumps, indentations, sharp edges, etc.?

This is a "burring" operation in contrast with the usual polishing and buffing operation on the surface of the pieces as part of the finishing operation. In some plants, burring has been quite a problem particularly where the need for hand work with hand de-burring tools seemed unavoidable.

Many a burring problem has yielded easily and economically to the use of the proper kind of flexible polishing wheel and the proper grade of Lea Compound. Lea Technicians, who have made an extensive study of burring operations and have helped many companies, will be glad to work with you on your problem.

We suggest that you send us samples of the work being finished with a detailed description of the final finish. Our laboratory will make thorough tests and report back with specific recommendations.

Burring, Buffing and Polishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions

THE LEA MANUFACTURING CO.
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